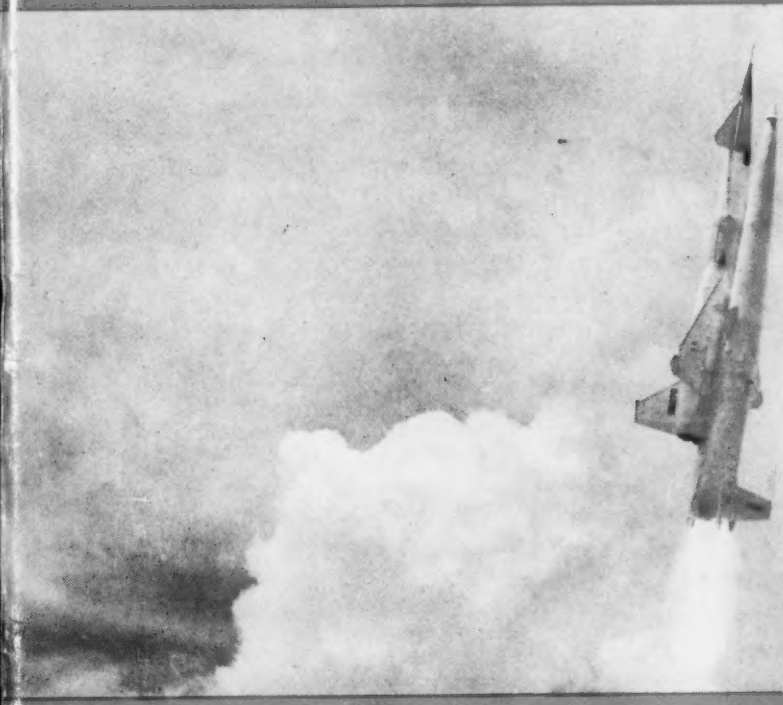
Products Finishing

FEBRUARY 1959



Titanium Plating for Missiles

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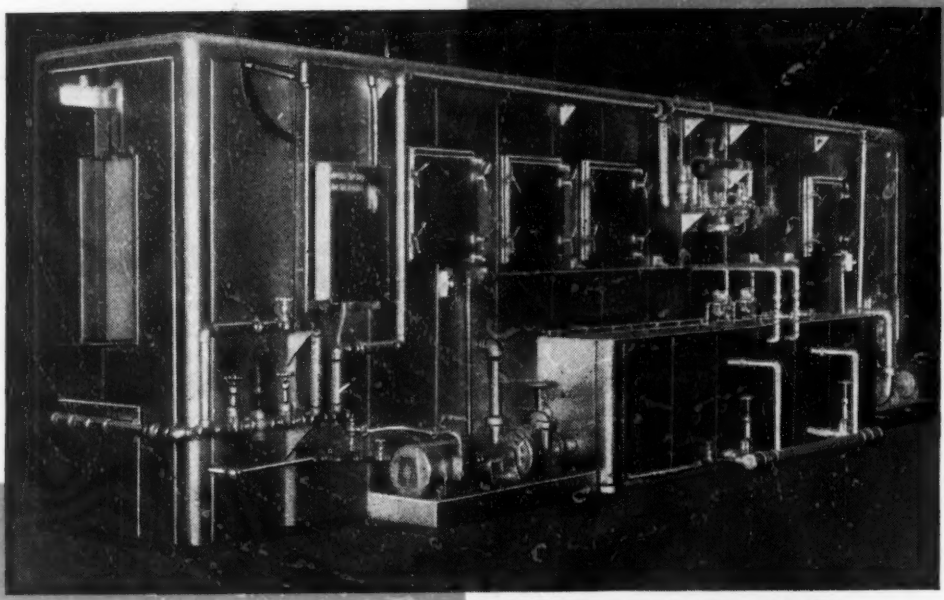
finishes on metal products



shining example of CLEANING EFFICIENCY

Cincinnati monorail wash, rinse & blow-off machine

for automotive parts

featuring . . .

- Completely Piped . . . ready for installation
- Insulated . . . for air-conditioned building
- Removable Steam Coils . . . easy maintenance
- Special Access Doors . . . water-tight

Installed in a big, new midwestern automatic transmission plant, this Cincinnati machine cleans an impressive variety and quantity of impeller covers and turbine assemblies.

In addition to a long list of the standard Cincinnati Cleaning features, it is equipped to provide extra savings . . . in installation, production and maintenance.

Cincinnati Cleaning & Finishing Machinery is designed specifically for your production problems, giving substantial savings over the life of the machine. Request a no-cost, no-obligation survey of your cleaning requirements . . . present or future. Write:

Cincinnati Cleaning & Finishing Machinery Co., 2008 Hageman St., Cincinnati 41, Ohio.

For more data circle 301 on Postpaid Card

50 years of results that satisfy just about everybody... except Oakite.

And we never will be satisfied. Our goal has always been to furnish even *better* cleaning at even *lower* cost—AND IT ALWAYS WILL BE!

Sure we're proud of the hundreds of Oakite "firsts" in developing fine cleaning compounds, cost-cutting methods, time-saving mechanical equipment. But we'll never rest on pride. As soon as we find a satisfactory answer to a cleaning problem —our research starts searching for an even better one.

That's why so many users continue to rely on Oakite to reduce their "per unit" cost. They know that year after year, they are getting the best cleaning for the lowest possible cost.

OAKITE
50 1909-1959 SCIENCE
years' leadership in industrial cleaning

Oakite's pioneering in the future will mean what it has meant for the past 50 years: not only better products, but better service . . . better methods . . . better equipment. All deliberately designed with you in mind to give *you* the most for your cleaning dollar.

This handy guide is a distillation of 50 years of Oakite cleaning experience. It can save you valuable time—and cold cash, too—on all your cleaning operations. Send for it. Oakite Products, Inc., 50A Rector Street, New York 6, N. Y.

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Wheels coated with ALUNDUM abrasive give a high polish faster, for less money. In setting up the wheels, the high capillarity of this polishing grain improves and speeds up the wetting process with glue or cement.

Set your polishing wheels up to save!

ALUNDUM abrasive brings you the value-adding, cost-cutting "Touch of Gold"*

Norton abrasives are first choice in many plants for the widest range of polishing jobs. Where especially long life is desired the blocky shaped E_1 ALUNDUM B abrasive is extremely popular. Available in grit sizes 14 to 240. Where faster cutting action is required E_{138} ALUNDUM R abrasive (sizes 100 to 240) is first choice. Both types are specially treated to give much greater adhesion with glue or cement.

Typical advantages common to all ALUNDUM polishing grains include:

- *Uniform grain shapes*, assuring fast, uniform cutting action.
- *Uniform grain sizings*, with no oversize grains to mar the finish, no undersize grains to loaf on the job.
- *High capillarity*, assuring the easy absorption of adhesive that means longer lasting, better performing set-up wheels.

The booklet "Setting Up Metal Polishing Wheels and Belts" contains valuable facts on the various types of ALUNDUM abrasive, and on the best means of preparing wheels. Ask your Norton Distributor for it. Or write to NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors around the world.

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

NORTON
ABRASIVES

G-355

Making better products . . . to make your products better

NORTON PRODUCTS Abrasives • Grinding Wheels • Grinding Machines • Refractories • Electrochemicals
BEHR-MANNING DIVISION Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

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The Leading Name in Immersion Heating

THERE'S A **Glo-QUARTZ*** **IMMERSION HEATER** for YOUR EVERY **HEATING REQUIREMENT**

All 3 Types

- INSTANT HEATING
- SHORT-PROOF
- AVAILABLE IN ALL VOLTAGES—WATTAGES, one and three phase
- STOCKED FOR IMMEDIATE SHIPMENT

TYPE "U"

PATENT PENDING World's **first** successful U-tube **ACID** Heater—Guaranteed to outperform and outlast all other quartz heaters.

TYPE "GN"

Pat. No. 2,740,881 Standard straight tube Quartz **ACID** Heater—Vapor-proof junction box; replaceable heating element.

TYPE "MB"

"Multi-Blade", Metal-sheathed **ALKALI** Heater—Portable, burn-out proof, easy mounting, long life.

WRITE FOR BULLETIN

If you're looking for
ACCURACY—EFFICIENCY—LONG LIFE—and ECONOMY
...you'll get it with Glo-QUARTZ!
Available from your Electroplating Distributor!

Glo-QUARTZ ELECTRIC HEATER CO., INC.

*Trademark Reg. U.S. Pat. Off. WILLOUGHBY, OHIO Phone: Willoughby 2-5521

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How to make metal blackening an exact science: What metal do you have to blacken? Steel, copper, brass, zinc? There are seven Ebonol® compounds in Enthone's specially developed series of blackeners for you to call on for jet blackness, maximum wear resistance and adhesion. Enthone is exceptionally well equipped and qualified to assist you in all phases of metal finishing. Years of practical experience, extensive research and service laboratory facilities manned by a team of specialists in the finishing field are at your service. Write us about your needs or problems. Send a sample of your product in question, if possible. Enthone, Inc., 442 Elm St., New Haven 11, Conn.

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58-2

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products finishing

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STEVENS

AUTOMATIC PLATING MACHINES CUT COSTS AND INCREASE EFFICIENCY—*IMPRESSIVELY*

FOR NATIONAL LOCK COMPANY

Read what Paul Repka, assistant plant engineer for National Lock Co., Rockford, Ill., says about his company's Stevens automatic machines:

"When we installed our battery of three Stevens Automatic Plating Machines in 1957, we were rewarded by an immediate increase in efficiency and an accompanying reduction in plating costs. The machines keep up with demanding production schedules easily. And their noteworthy savings in material and labor costs have proved to us that for high volume, low-cost metal finishing, Stevens Automatic is the right answer."

Just as Mr. Repka did, an ever-growing number of metal-finishing and plating executives are learning of the increased production capabilities and cost-cutting abilities of Stevens automatic plating equipment. If your present method of plating isn't giving you all you expect of it, contact your local Stevens sales representative now. Let him show you the automatic Stevens way to more profitable plating and processing.

***Remember*—when you go *automatic*—go STEVENS**

frederic b. **STEVENS, inc.**

DETROIT 16, MICH.

BUFFALO CHICAGO DETROIT CLEVELAND
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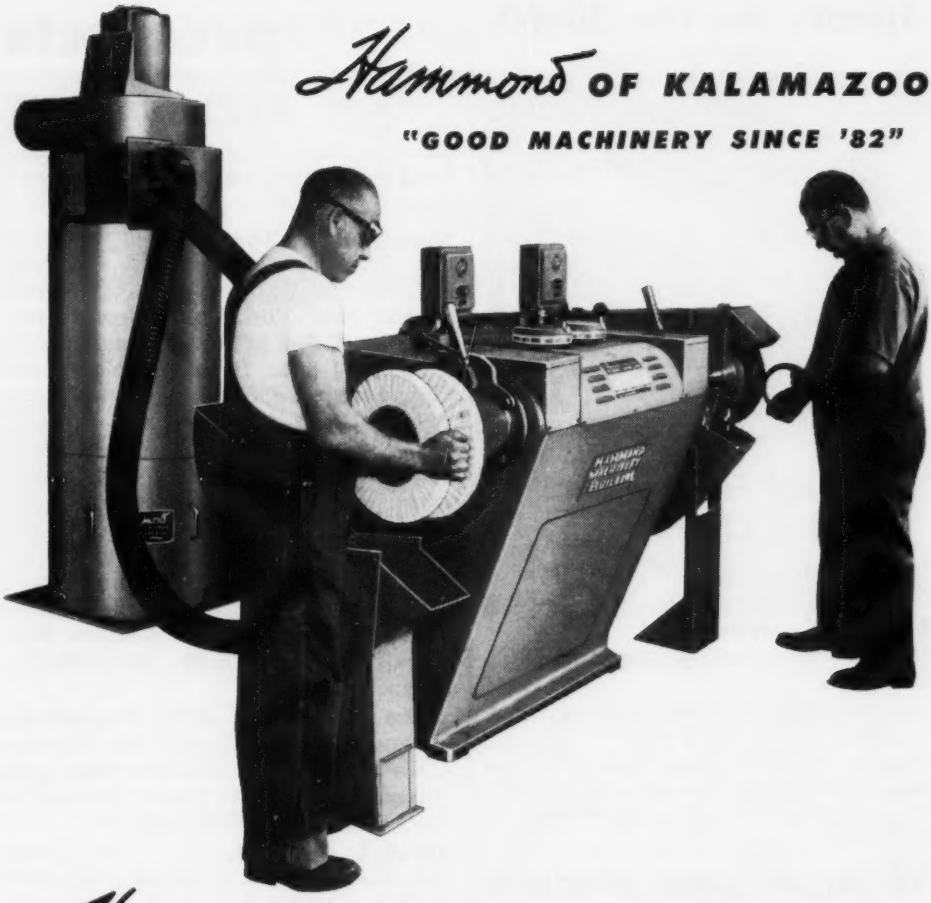
Hammond OF KALAMAZOO

"GOOD MACHINERY SINCE '82"



Hammond MODERN SELF-CONTAINED TWO SPINDLE GRINDER-POLISHER

Reduce finishing costs — step up production with this modern, self-contained variable speed Grinder-Polisher.

Lathe has individual, variable speed dial control for each spindle. No "down time" for one operator when the other must increase speed or change wheel. Cyclone DusKolector requires little floor space. Backstand is one of 10 Air and Spring Tension Models to choose from.

Cost reduction through increased efficiency is the need of the day. Write for catalog showing America's most complete line of polishing and buffing machinery.

Hammond Machinery Builders INC.

1622 DOUGLAS AVE. • KALAMAZOO, MICHIGAN

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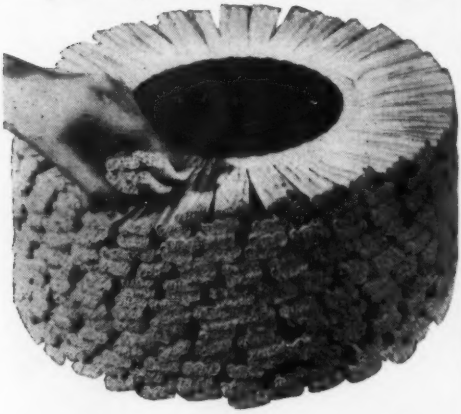
Specify the No. 20-RD



A Sisal Finger-Buff* by Churchill

FASTER cutting action!

LONGER wearing qualities!

REMARKABLY smoother finish!

FLEXIBILITY never before achieved in a sisal buff!

The No. 20-RD illustrated produces exceptional results on stainless.

Churchill No. 20-RD Sisal Finger-Buffs* are competitively priced. Produced in all sizes from 3" to 21" diameters. Write for complete information.

Write us your problem

Solving "every-day" and "specialized" buffing problems has been Churchill's ***only*** business for 21 years. Originator of the Finger-Buff*, Churchill has developed and carries in stock a Churchill Finger-Buff* for nearly every buffing, polishing and coloring operation.

*The trade's attention is called to United States Patent No. 2,724,937, issued November 29, 1955, to George R. Churchill covering the cloth-covered sisal buffing wheel manufactured by George R. Churchill Company, of Hingham, Massachusetts, exclusive licensee, and marketed under its trade-mark, "FINGER-BUFFS", Reg. U. S. Pat. Off.

*Churchill Finger-Buff, T.M. Reg. U.S. Pat. Off.

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Dept. PF-29, Hingham, Mass.

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products finishing

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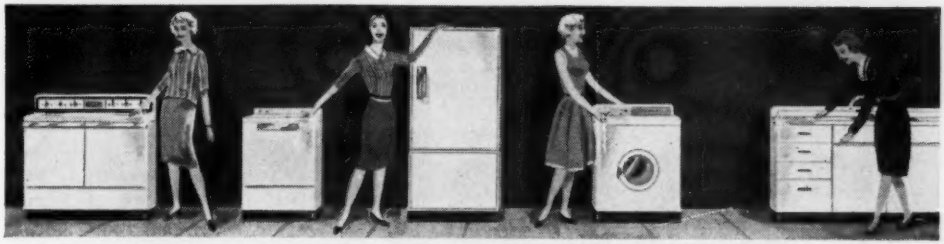
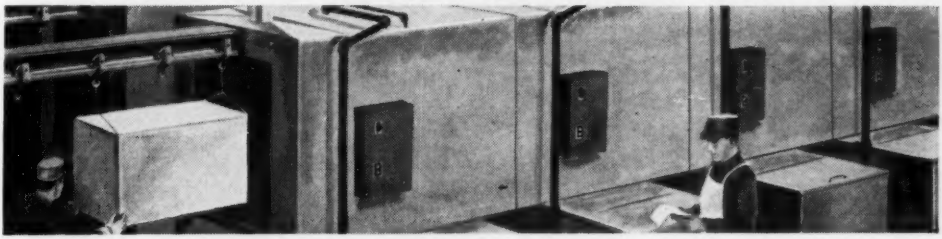
Circulation over 21,500— largest in the finishing field

PRODUCT PROTECTION



MEANS CUSTOMER SATISFACTION



WITH AMCHEM GRANODINE

Mechanical and electrical performance notwithstanding, the external appearance of appliance products weighs heavily in determining continued brand preferences.

That is why many major appliance producers have insisted upon the use of Amchem Granodine as a durable base for paint finishes. This efficient chemical solution ideally converts metallic surfaces to a nonmetallic phosphate coating of the proper texture, acts as a reliable inhibitor of corrosion while greatly increasing the adhesion and durability of the paint finish.

You'll find Amchem Granodine an economical and reliable method of providing that lasting protection so important to the future sale of your products . . . at a cost consistent with manufacturing budgets. And you can count on Amchem's complete technical and engineering service to keep Amchem chemicals working at the level of greatest efficiency in providing protection that lasts for the life of your product.

Shown above is typical Amchem power spray system for chemically treating steel products.

Write for Bulletin 1380A with handy Selection Chart to help you choose proper Granodine type for your specific needs. Also available are bulletins describing other Amchem chemicals for use in appliance manufacturing.

AMCHEM GRANODINE

Amchem Granodine is another chemical development of **Amchem Products, Inc.**, Ambler, Pa. Formerly American Chemical Paint Company • Detroit, Mich. • St. Joseph, Mo. • Niles, Calif. • Windsor, Ont./Amchem and Granodine are registered trademarks of Amchem Products, Inc.

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Quality

chrome plating is our goal for you!

Here, at Diamond, our plating specialists strive constantly to raise the standards of chrome plating.

For example, they developed DIAMOND CPA 1800 for you. It is *the additive* for chrome plating which increases plating speed, expands tank capacity, improves throwing power and the metallurgical character of chromium plate.

And, when you specify and use DIAMOND CHROMIC ACID, you get the latest facts on all phases of chromic acid application, research, testing. Facts that can help you lick a production problem, quality problem, or research problem.

For top-quality plating get DIAMOND CHROMIC ACID and DIAMOND CPA 1800 *plus* all the facts from your Diamond Representative or your nearby Diamond Distributor. They can be mighty helpful . . they can supply DIAMOND CHROMIC ACID where and when you need it. Diamond Alkali Company, 300 Union Commerce Building, Cleveland 14, Ohio.

Diamond Chemicals

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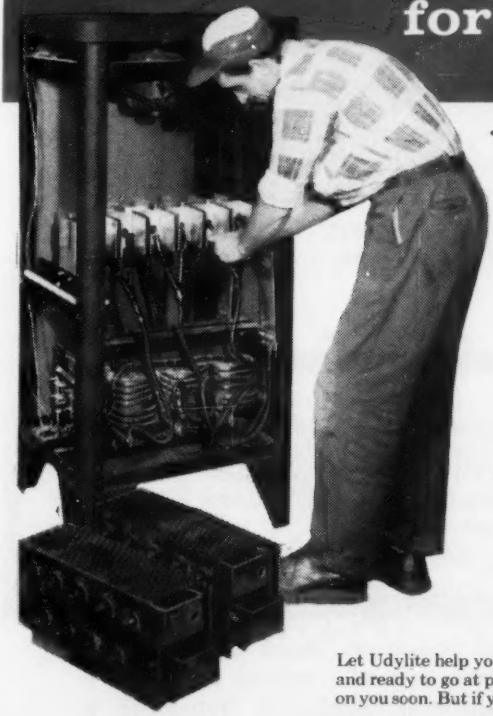
Project Alert Working at UDYLITE *Produces for You...*

SILICON EFFICIENCY, RUGGEDNESS AND LONG LIFE

for old rectifiers



1. **A SPECIAL PRODUCT . . .** For the first time, a Udylite-engineered, Udylite-built *silicon* replacement stack is offered for you to use in revitalizing your Udylite magnesium-copper-sulphide or selenium rectifier and upgrading its performance to the level of today's best. *And you can do this in your own shop*, without delay, at a minimum of expense and down time.
2. **A SPECIAL SERVICE . . .** As an alternate plan, your old rectifier can be returned to Udylite for *factory* installation of the silicon replacement stacks by trained rectifier specialists. At the same time, your rectifier will be completely overhauled and tested so that it will be returned to you renewed and ready for the longer life and high efficiency of Udylite silicon.
3. **A SPECIAL VALUE . . .** This whole program is set up as a Project Alert. A special department will handle your order and your equipment from start to a completely satisfactory finish. A *guaranteed delivery* will keep your down time to a minimum. With prices based on a production line plan, you will get more value per dollar spent than you ever before thought possible.

Let Udylite help you get your entire plating operation in top working order and ready to go at peak capacity. Your Udylite sales engineer will be calling on you soon. But if you need priority service, write, phone or wire directly to.

the udylite corporation

PROJECT ALERT

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REALLY NEW!

We invite you to investigate
the many important advantages of

Guardsman®

HYPALON*-Based Coatings

HYPALON*, the most exciting new film former of the day, makes possible finishes of unusual elasticity with excellent resistance to chemicals, humidity, fire, abrasion, fading and ozone cracking on rubber goods.

VERSATILE Hypalon*-based finishes may be applied by roller coat, doctor blade, spray, dip, or silk screen . . . air dry or bake

AS the largest producers of coatings based on Hypalon*, we invite you to investigate the marked advantages of its use on polyurethane, vinyl and rubber foams, rubber products, fabrics, metal, wood, concrete, plaster, hardboard and Mylar*

WRITE for more specific information as to how our Hypalon-based formulas can be adapted to meet your specified needs.*

* Registered trademark of the E. I. DuPont Company

Dept. HY-13

GRAND RAPIDS VARNISH CORPORATION

Grand Rapids, Michigan

Makers of the Famous ®Guardsman *Finish and* ®Guardsman *Cleaning Polish*

THE BETTER THE FINISH, THE BETTER THE BUY

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*AIRLESS

*Spray Painting without air

and what it can do for your company

R. & W. Wiley Co., Buffalo, N. Y. manufactures a complete line of fluorescent and incandescent lighting fixtures. By utilizing Nordson Airless* Spray Painting in applying a white baking enamel to their products they have been able to achieve the following cost cutting advantages:

- **At least a 25% paint savings**
- **Improved product protection and appearance**
- **Lowered exhaust requirements**
- **Decreased booth maintenance**
- **Reduced health and fire hazards**
- **Estimated 30% labor savings**

NORDSON CORPORATION

FORMERLY BEDE PRODUCTS CORPORATION

THE BEST IN SPRAY COATING EQUIPMENT

AMHERST, OHIO **YUKON 8-4473**

In Canada: 864 Pape Ave., Toronto, Ontario

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consult the..... *Roto-Finish*

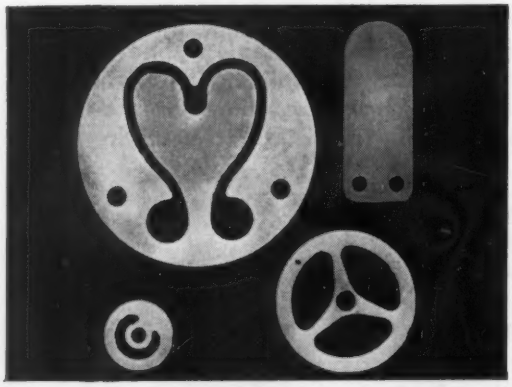
CUSTOMER'S MAN

FOR FINISHING PLUS + RESEARCH and TECHNICAL ASSISTANCE

Faced with the problem of cutting down finishing costs with no sacrifice in product quality, more and more production and management men are turning to Roto-Finish for complete finishing *service*.

In the Roto-Finish Laboratory, technicians analyze your problem to determine the process which provides the desired finish at minimum cost. Often, it is necessary *to develop a new compound* to meet a specific need.

Test runs are then made in the Roto-Finish Processing Department under production conditions. If desired, your local Roto-Finish Customer's Man will run these tests in your own plant; so that you can check the results at first hand, results like this . . .



Roto-Finish CASE HISTORY

PART: Refrigeration compressor flapper valves.

MATERIAL: Swedish steel.

OPERATIONS PERFORMED: Deburr. Generate full radii on all edges. Remove stress risers.

RESULT: Fatigue resistance increased 500%.

ROTO FINISH®

Roto-Finish **COMPANY**

3704 Milham Road, Kalamazoo, Michigan

Phone: Fireside 3-5578

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FREE!

do-it-yourself PHOSPHATING ANALYSIS KIT

MAIL COUPON TODAY

TURCO PRODUCTS, INC.
6135 So. Central Ave., Los Angeles 1, Calif.

Please send, without obligation, my free Phosphating Analysis Kit.

Name_____

Firm_____

Title_____

Address_____

☐ *Check here for on-the-job survey by Turco field engineer.*

PF

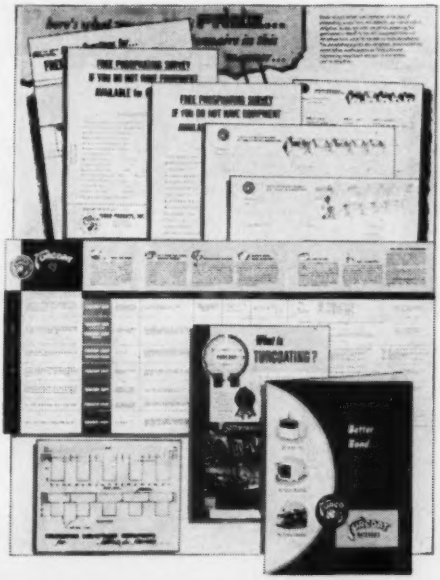
Whether or not you are currently Phosphating you owe it to yourself to send today for your free Turco Phosphating Analysis Kit!

■ **IF YOU ARE NOT PRESENTLY PHOSPHATING,** this Kit will enable you to determine how your products may be adapted to phosphating and to the many paint adhesion advantages it offers . . . how a Turcoat phosphating process can be tailored to fit your own individual cost and production requirements.

■ **IF YOU ARE ALREADY PHOSPHATING,** you can use this valuable Kit to check on the efficiency standards and cost of your present phosphating installation.

■ **IF YOU HAVE NOT INVESTIGATED COLD PHOSPHATING,** this Kit will show you how you can realize tremendous heat savings and minimize maintenance costs with a proven cold phosphating process.

Turcoat processes currently in use range from small, inexpensive 3-tank set-ups all the way to elaborate 11-stage spray washing systems. With Turcoat, paint is anchored uniformly...permanently. Should accidental gouging occur, there is no corrosion "creep back" under the paint. Turcoat processes slash number of rejects and other problems involved in improper preparation, minimize packing and crating costs, establish and assure customer preference.



Write or mail the coupon today for your Kit. There is no cost...no obligation

TURCO PRODUCTS, INC.

Chemical Processing Compounds

6135 South Central Avenue, Los Angeles 1, California

Factories: Newark, Chicago, Houston, Los Angeles, London, Rotterdam, Sydney, Mexico City, Paris, Hamburg, Montreal, Naha (Okinawa)

Manufactured in Canada by B.W. Deane & Co., Montreal. Offices in all Principal Cities

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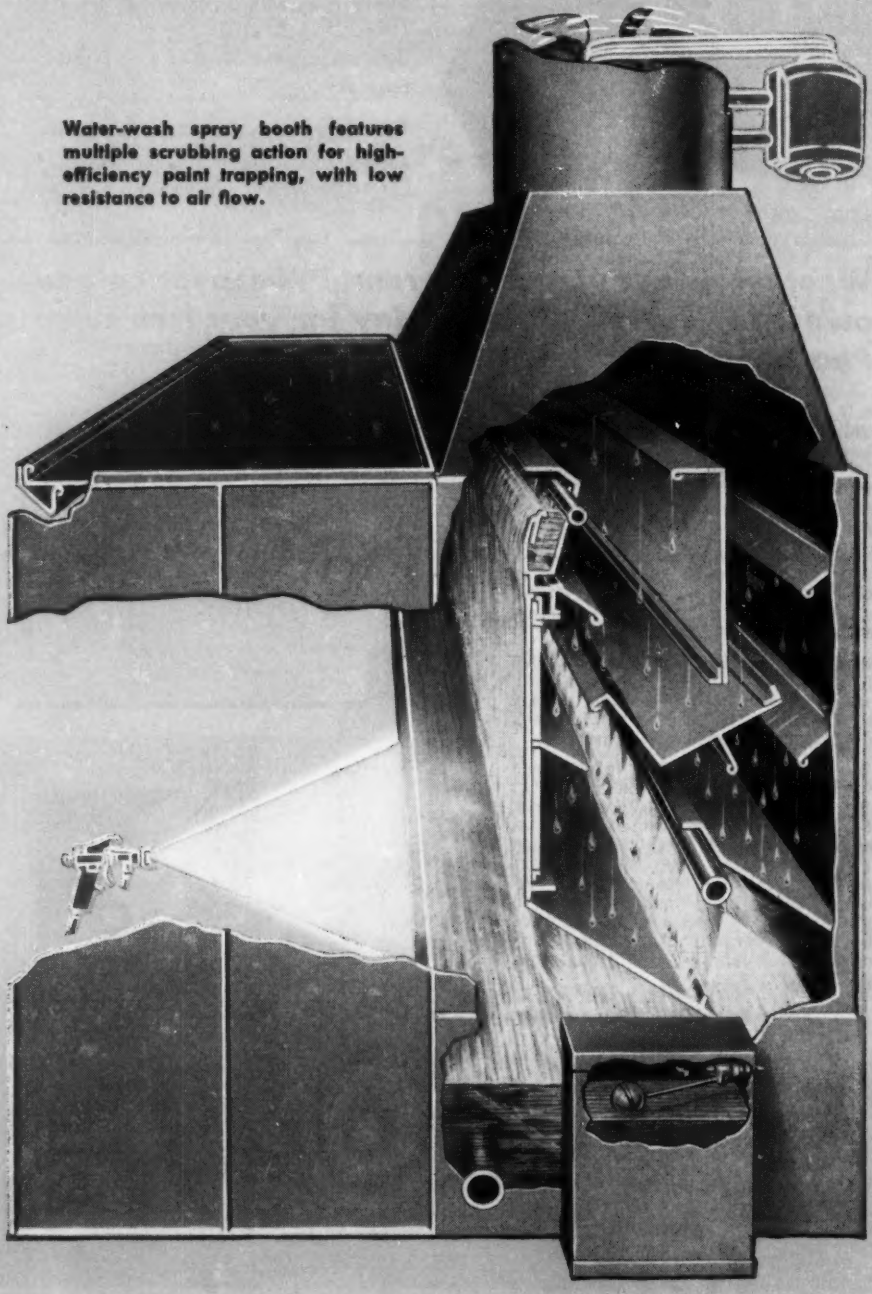
Why DeVilbiss offers



Water-wash spray booth features multiple scrubbing action for high-efficiency paint trapping, with low resistance to air flow.

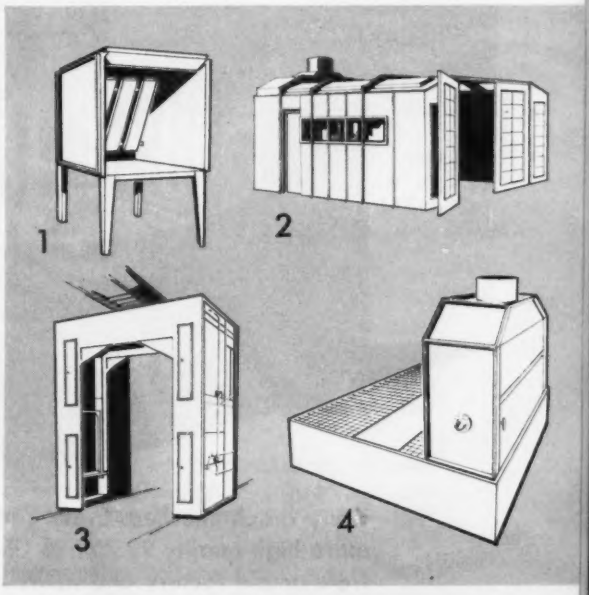
you the best value in spray booths today

- **Standardized parts and modular, prefabricated steel panels provide more rigid, more versatile, more durable booths at lower cost!**
- **Specific models, standard or custom-designed, for every spraying operation —automatic, electrostatic, manual!**
- **Each model and type is job-rated, job-proved for guaranteed performance!**
- **Manufactured to the standards of the National Board of Fire Underwriters for spray booths as recommended by the National Fire Protection Association!**

When you choose a DeVilbiss spray booth, you get the unit best suited to your purposes, *at great savings.* That's because DeVilbiss offers economy of operation, efficiency of performance, and ease of installation made possible by scientific adaptation of modular design principles.

Bolt-together construction saves erection time; offers flexibility for revamping or moving booths as operations and plant layouts change. Design and construction features provide excellent paint-trapping efficiency; stay cleaner longer; save maintenance time and expense.

So contact your nearest DeVilbiss branch office for complete details on any of the more than 500 standardized spray booths . . . or write for a copy of Spray Booth Catalog I-7000.



(1) Leg-type booth, (2) enclosed booth with dust filters, (3) traveling booth, (4) down-draft booth, and all other DeVilbiss booths have bolt-together panels; rolled edges; mitered, welded corners for built-in reinforcement.

FOR BETTER SERVICE, BUY
DEVILBISS

THE DEVILBISS COMPANY
TOLEDO 1, OHIO
Barrie, Ont. • London, England • São Paulo, Brazil
Branch Offices in Principal Cities

DUST COLLECTORS • INDUSTRIAL POWER WASHERS • FLOW & DIP COATERS • OVENS • SPRAY BOOTHS • AIR COMPRESSORS • SPRAY EQUIPMENT • HOSE & CONNECTIONS • MIST COOLANT UNITS

For more data circle 318 on Postpaid Card

Product: 99.75+% Pure
Service: 100% Sure

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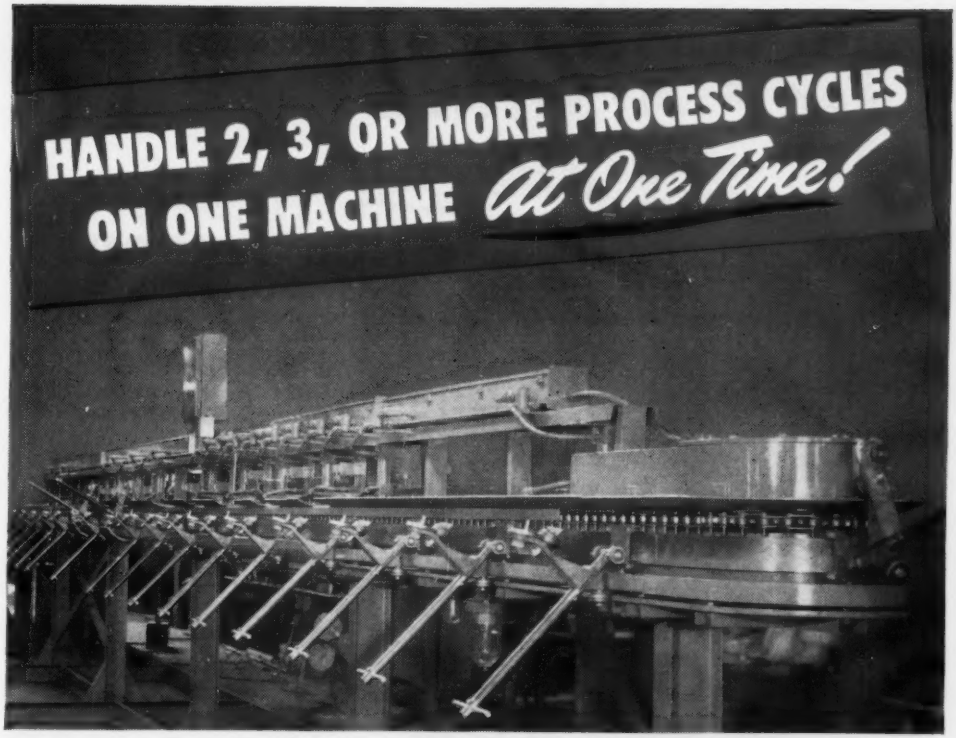

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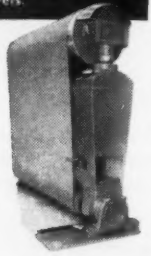

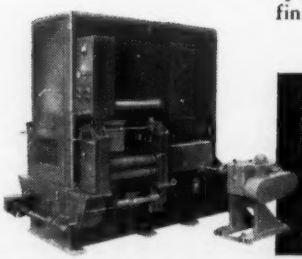

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editorial

Should Job Platers Specialize or Diversify?

Every job plater is continually faced with the problem of deciding whether to specialize in one or two types of plating or add to his list of services.

Many platers apply only certain electroplates, feeling they can do a better job and give better service if they devote full attention to one or two processes. Some do barrel plating only. Some do only hard chromium plating. Many have installed facilities to do copper-nickel-chromium decorative plating. Some concentrate on gold plating. Others repair and plate silver.

Some platers, however, have been hurt by overspecialization. They catered to one or two industries, and when these industries had a bad year, the shops that served them suffered more than the average. The plating businesses set up to plate die castings for the automotive industry, for instance, were hurt because automobiles didn't sell too well last year.

The obvious answer for these platers is diversification. But just how to diversify is not so easy.

One way is to add facilities to apply other kinds of finishes—anodizing equipment, paint finishing equipment, spray decorating machines, maybe even vacuum metallizing equipment. The latter requires a large investment, but if the potential business is in the plater's area, it's certainly not too far afield—it's still a plate even if applied by a radically different method.

There is another side to this method of diversifying, however. The plater can add a lot of equipment and increase his investment substantially without sufficient potential business to justify it. This can result only in a lower rate of return. Additional equipment should be added only if studies show that a substantial market exists in the area.

The plater who cannot diversify by adding new processes must diversify by selling the same services to other industries—perhaps by making his shop more efficient and lowering costs or by studying his methods so as to upgrade quality.

The decision to specialize or diversify and how to do it can be made only after careful study of the market in a given area.

Ezra A. Blount

—EDITOR

Painting 32 Wheels Per Minute

By EZRA A. BLOUNT
Editor

Wheels are spray painted on a conveyor moving 54 feet per minute in the Monroe Plant of the Metal Stamping Division, Ford Motor Company. This plant also manufactures bumpers, hub caps, stabilizer bars, lamp housings and springs. One section of the plant is devoted to the fabrication and finishing of wheels for Ford and Mercury automobiles.

Sheet steel, pre-cut to the specified size, is delivered to this plant by trucks which are brought into the production area of the building.

A bridge crane that moves over the full length of the plant delivers the bundles of sheet stock to the

The 1959 Ford retractable hardtop. Wheels were painted in Monroe, Michigan plant.

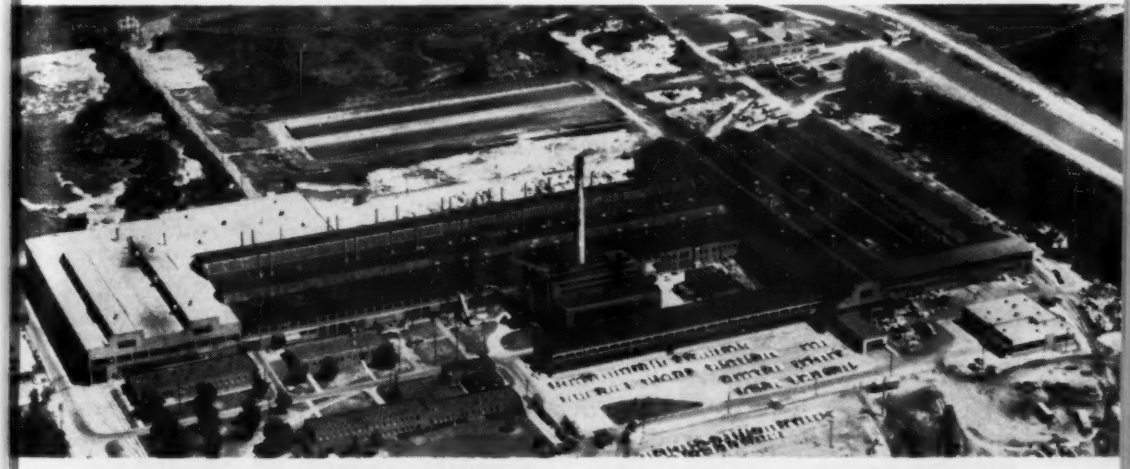
Wheels for Ford and Mercury automobiles are fabricated and painted electrostatically in Ford plant at Monroe, Michigan. Operations are automated and conveyorized. Manual handling of parts during the process is at an absolute minimum.

shear, where the stock is automatically sheared to correct strip size.

The bundles of sheared strips which will be formed into wheel rims are carried by the overhead crane to the loading station of the roll former. In this machine the steel sheets, 0.122 inch thick, are automatically rolled to form rims.

The formed rims roll down a chute to a battery of automatic welders, where the edges of the rims are butt-welded.

The rims then feed automatically through four forming operations. The first operation is performed in a "flat" forming press to "cup" each side of the rim. The next three form-



Aerial view of Ford's Monroe, Michigan, plant. About 1600 persons are employed here.

"The wheels are not touched by hand . . . until they are unloaded into the freight cars as painted wheels."

ing operations are performed on roll formers which form the rim to its final shape. Operators control the process by means of push buttons. The rims are then corrected for size and concentricity, and the flanges are straightened.

Wheels are made by joining rims with center spiders. The spiders are formed from coil stock of the same thickness as the rim stock. The coil stock, like the flat rim stock, is unloaded from the trucks in the production area and then carried to the loading station of the forming presses by the overhead crane. The coil stock feeds directly and automatically into a series of three forming presses, where the stock is punched and formed.

In the case of both the rims and the spiders, the flow of work is across the production floor from the railroad siding or unloading area, through the various forming operations, and onto a flat-bed conveyor which collects the formed products and carries them to the assembly area. Here the spiders are riveted to the rims by automatic machines to form the completed wheels.

Finishing

Completed wheels are inspected on spinners to check concentricity before being released to the finishing area.

The completed wheels roll down controlled inclines to the loading area (Fig. 1) of the automatic cleaning, phosphatizing, and paint finishing section.

There are two complete and identical finishing units — one for Ford wheels and one for Mercury wheels. Wheels are hung on one of the overhead monorail chain conveyors. This conveyor carries them through the complete finishing process and to the freight cars in the plant. The wheels are not touched by hand from the time they are hung on this conveyor until they are unloaded into the freight cars as painted wheels.

Wheels are hung on conveyor hangers located at 20-inch centers, and, moving at 54 feet per minute, enter one of two David-Ludwig cleaning, phosphatizing and drying machines (Fig. 2). The process is as follows:

1. Spray clean for one minute with Parco 451 cleaner solution operated at 90 deg. F.
2. Spray rinse for one minute with cold water.
3. Dip phosphatize for 2½ minutes in a solution of Bonderite D-180 held at 180 deg. F. The conveyor dips down into the 6,000-gallon tank, making four turns while in the solution.
4. Spray rinse with Parcolene. Room temperature.
5. Dry in gas-fired convection oven for two minutes at 180 deg. F. Bristol automatic control holds temperature at desired point.

Wheels leave the oven, cool for 1½ minutes, are routed past an inspector who checks visually for complete coverage of phosphate coating and mechanical defects.

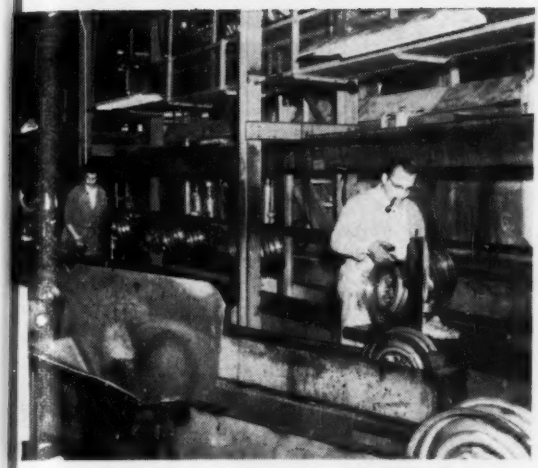


Fig. 1—Loaders working at three stations hang wheels on the finishing conveyor. Spray washing section of cleaning and phosphatizing machine is directly behind loaders.

The phosphatized wheels pass into a water wash spray booth, where they are sprayed with one coat of gloss black primer. Ionic electrostatic painting installations located in two adjoining spray booths finish the wheels automatically. The first of these installations consists of four Ionic guns which spray the rim and back of each wheel (Fig. 3). The wheels ride along a rod that positions them at the correct angle for painting. The wheels then enter the second section of the double booth, again riding along a rod that positions them accurately so that the "face" of each wheel can be sprayed. Three Ionic electrostatic guns accomplish this paint job.

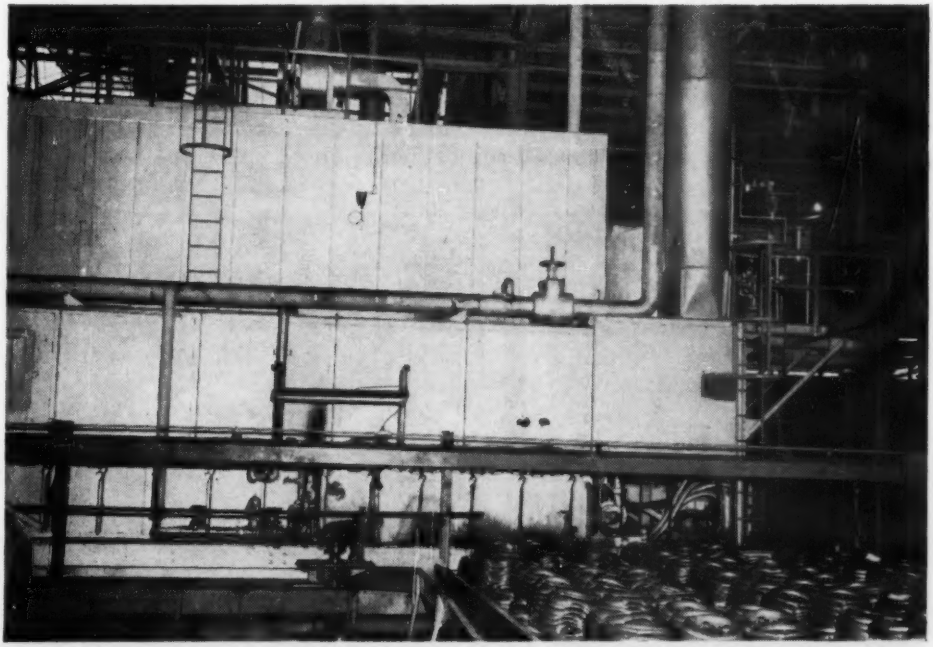


Fig. 2—Phosphatizing and drying section of David-Ludwig machine. Drying oven section of the machine is built above the dip phosphatizing section. Cleaned, phosphatized and dried wheels leave machine at right, then, after cooling, enter electrostatic spray booths.

The spray conveyor is grounded. An electrostatic charge of 150,000 volts is accumulated at the spray gun heads to charge the paint particles and cause them to collect on the wheels uniformly.

A "memory wheel" or "memory device" controls the guns so that they do not spray if a hook is empty. The memory device, electronically controlled, is on the conveyor ahead of the guns. Rarely, however, does an empty hook pass the spray guns. Key to this high production operation is keeping the production lines full of parts being painted at all times.

Leaving the spray booth, the painted wheels travel through air for about one minute as they are conveyed to a pre-heat tunnel, the entrance of which is above the working level of the production floor. Entering the 50-foot-long infrared tunnel oven (Fig. 4) through an opening 14 by 36 inches, the wheels are heated from room temperature to 300 deg. F. in less than one minute. Quartz infrared tubes heat the oven to 400 deg. F. A Partlow control maintains a uniform temperature in the oven.

The pre-heat tunnel oven connects with a large gas-fired convection oven (Fig. 5) on the plant production floor. Wheels pass directly out of the tunnel into the convection oven, where they are baked for six minutes at 400 deg. F.

Leaving the baking oven, the wheels travel past an unloading station where some wheels are unloaded into special racks for shipment to Ford's Dearborn assembly plant. The wheels not unloaded at this point travel to freight cars (Fig. 6), where they are unloaded and packed for shipment to Ford and Mercury assembly plants in various cities of the United States.

Quality Control

Ford specifications call for a ¾-mil thickness of baked paint finish. Technicians check thickness at least

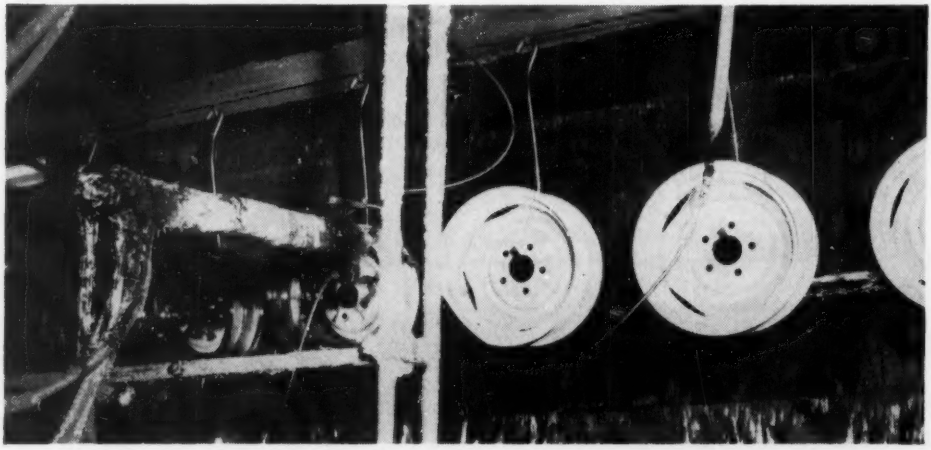


Fig. 3—Ionic electrostatic spray guns paint wheels in water wash spray booth built by International Conveyor & Washer Corp. An electrostatic charge of 150,000 volts aids in producing a uniform paint film over all surfaces of wheels, which pass guns at 54 f.p.m.

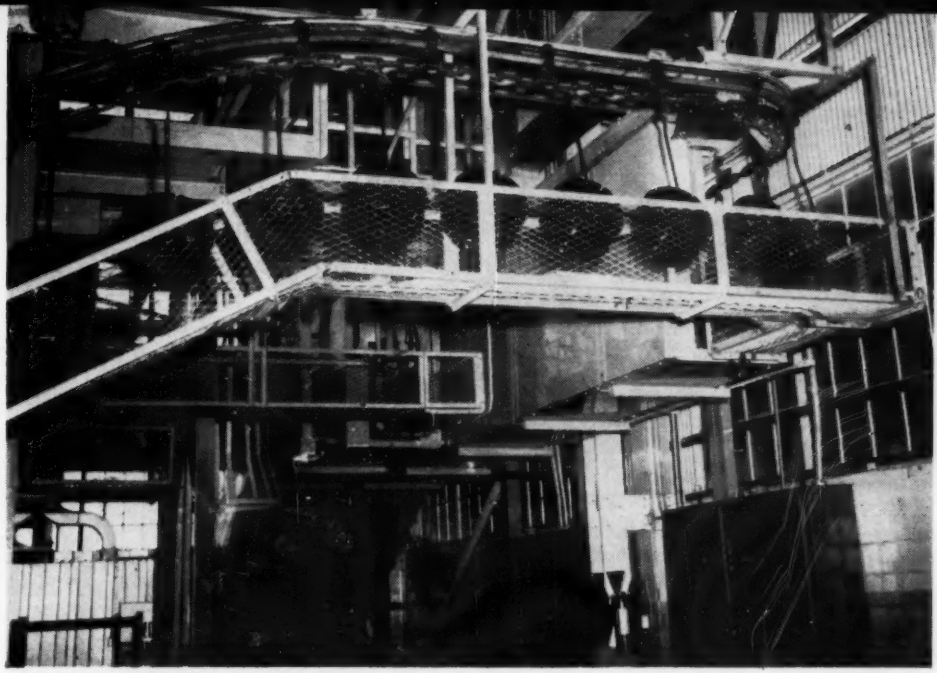


Fig. 4—Completely painted wheels are carried to upper level of plant, enter 50-foot infrared oven (right) for rapid pre-heat drying. Infrared heaters in this oven raise temperature of the painted wheels to 300 deg. Fahrenheit in less than one minute.

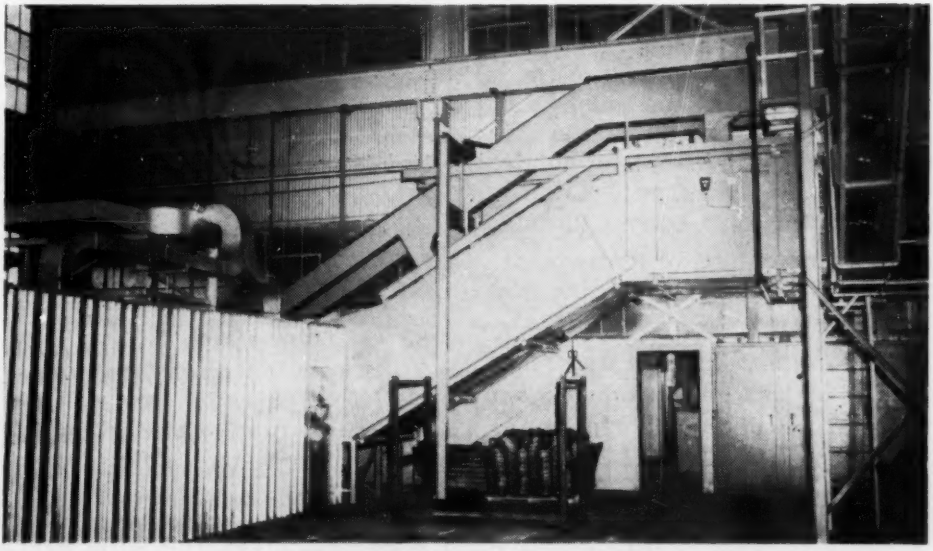


Fig. 5—As can be noted, pre-heat oven (John J. Fannon Products Co., Detroit) is an infrared tunnel that is constructed so that wheels descend to factory floor level as they travel through. The infrared oven is connected to a gas-fired convection oven (left) built by C. A. Dauer Company, Detroit, Michigan. Here wheels bake for six minutes at 400 deg. F.

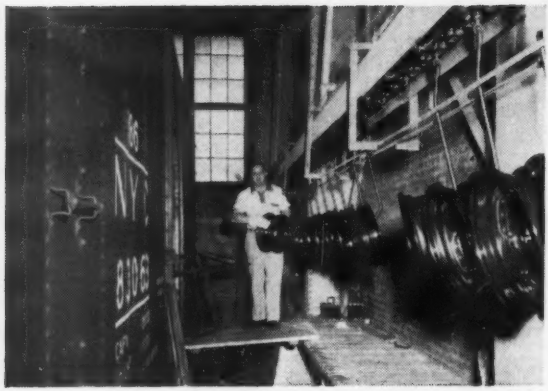


Fig. 6—Painted, baked wheels, still on the finishing conveyor, are transported to freight cars in the plant loading area. Wheels are unloaded and packed for shipment. Empty conveyor returns to wheel loading area. (Photographs by PRODUCTS FINISHING)

once an hour with a Magne-Gage.

Ford engineers state that this painting process is the fastest electrostatic painting being done anywhere. Key to the successful operation of this high-speed process is the formulation of the paint being sprayed. It is generally true that paint products must be formulated with the method of application in mind. In this case, correct formulation is vital.

ACKNOWLEDGMENT

The author acknowledges with sincere thanks the assistance and cooperation of Mark Kaiander, plant manager, Robert Fleming, paint manufacturing engineer, Francis Sanglier, general foreman, wheel department, Monroe Plant, and P. A. Raft, industrial relations manager, in making available information upon which this article is based.

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Current Practice in Chemical Milling

A survey of chemical milling processes as they stand today; data on methods being used for cleaning, masking, etching, and for milling aluminum and other metals, such as magnesium and stainless steel . . .

By DR. NEIL W. BERST
Director of Research Laboratories
The Diversey Corporation
Chicago, Illinois

Chemical milling is a process used primarily by the aircraft industries to remove metal by chemical etching from fabricated parts that previously were machined in a mechanical milling operation. Hence the term "chemical milling" is descriptive of the process' similarity to mechanical milling. The process has been patented under U.S. Patent 2,739,047.

Chemical milling may be used simply to remove weight or to fabricate more complicated parts by selective etching, using a masking material on the areas that are to remain unetched.

The process allows deep cuts to be made without the danger of distortion that is often a problem in mechanical milling. The depth of the cut is controlled by the time of immersion in the etching bath. Some parts are processed using both methods of milling: parts are first mechanically milled to the maximum depth possible without distorting the part; this is followed by chemical milling to effect further weight reduction. The weight saved is obviously important in aircraft construction.

In addition to being able to produce thinner parts by chemical milling than is sometimes possible with conventional machining, it is possible to make intricate design cuts more easily. The process is no more complex than cutting the proper pattern in a template.

Design changes are much more quickly carried from the drawing board to actual production, because only a new template has to be made to convert an old design to a new design. This is in contrast to the

retooling required when a major design change is made in a mechanically milled part. The adaptability of the chemical milling process to the constant design changes occurring in the aircraft industry makes it a valuable tool in modern aircraft production.

In some cases the cost of chemical milling and mechanical milling will be about the same. In cases where design changes are made frequently and in cases where only moderate quantities of parts are required, chemical milling will prove to be the cheaper process. In regard to equipment costs, the tanks required for the etchant plus the hoods and duct work required to carry away the etching fumes will almost always be cheaper than a major machining installation.

Most chemical milling has been done on the aluminum alloys used by the aircraft industry and a description of the milling of those alloys will serve to illustrate the process.

Cleaning

Proper preparation of the metal surface is necessary to obtain good adhesion of the masking material and, subsequently, to obtain uniform removal of metal in the etching bath. The customary cleaning procedure is as follows: clean in a hot non-etching alkaline aluminum cleaner, rinse, deoxidize in typical chromated deoxidizer, rinse.

In the early stages of development of the process a conversion coating was used as the last step before masking. Present masking materials can be removed by hand stripping after the etching, and a conversion coating is not desirable because it makes stripping difficult. Masks adhere well to the surface produced by using the cleaning cycle described, and masking mate-

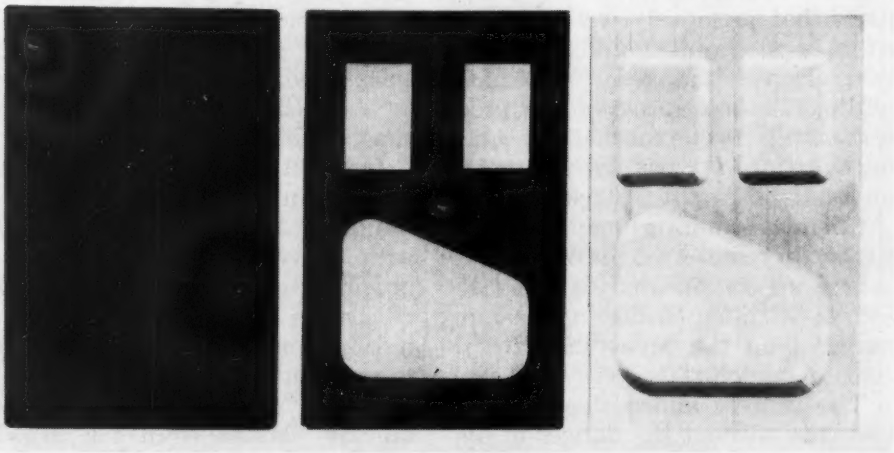

Fig. 1—Panels illustrating steps in the chemical milling process. Panel 1 (left)—masking material applied uniformly to entire part surface. Panel 2 (center)—sections to be chemically milled are scribed and maskant is stripped from template by hand. Panel 3 (right)—part is chemically milled and remainder of maskant is removed from completed part.

". . . anything less than 100 per cent coverage and protection by the maskant leads to rejection of the part . . ."

rial can be removed without difficulty after the etching operation.

Masking

Obtaining a satisfactory masking material was one of the difficult jobs connected with the development of chemical milling. It is necessary that the masking material withstand the etching solution, which in the case of aluminum is a 10 to 15 per cent caustic solution used at 195 deg. F. The masking material must also provide a sharp, uniform line between the masked and unmasked areas. This requires good adhesion between mask and metal. The maskant film must be strong enough not to collapse over the already etched portions as the etching solution cuts back under the maskant.

The masking material is generally a neoprene or vinyl coating. At the present time neoprene seems to be in most favor. The masking material is generally applied by dipping. Three to five coats are used to ensure complete coverage of the metal. Air drying between coats is usually sufficient. After the final coat is applied, the completely masked part is cured at 200 deg. F. for 30 minutes to one hour.

After the maskant has been cured, a template cut out at the areas where etching is to occur is placed on the masked part and the masking material is scribed with a sharp knife, outlining the areas that are to be etched. The masking material is then peeled off from the areas to be etched. In the process of etching, there is the same degree of lateral cut as there is downward cut and therefore it is necessary to allow for that lateral etching in designing the template.

After the part has been masked and scribed it is inspected for flaws in the masking material. Any flaws or areas that may be easily damaged in handling the part are covered with pieces of adhesive-backed lead tape. Since anything less than 100 per cent coverage and protection by the maskant leads to rejection of the part, too much attention cannot be given to the cleaning and masking steps.

Etching

The etching solution in the case of aluminum is usually a caustic-base material used at a concentration of 10 to 15 per cent caustic at temperatures as high as 195 deg. F.

The higher operating temperatures have the advantage of causing violent agitation during etching. This helps eliminate the problem of hydrogen and solution entrapment at the edges under the masking material and is an aid to uniform etching. Also, the higher temperatures result in faster etching rates, thereby reducing time of etching.

Since rate of etch can be determined for a given alloy, the depth of etch can be approximated by timing the immersion of the parts. The depth of etch is checked near the end of the etching cycle. Then it is usually possible to etch to the

final desired depth by calculating the slight additional time necessary to complete the job. The etching rate varies enough as sodium aluminate is built up in the bath that it is not possible to count on an absolutely uniform etch rate throughout the life of the bath.

Etching is followed by a water rinse, and the smut built up in the etching bath is removed with a chromate-type desmutter.

Removal of Maskant

The masking material is removed by hand stripping. The development of a strippable coating gave considerable impetus to the chemical milling process because it makes it easier to remove the maskant. Strippable coatings are much more satisfactory than the initial method of using a film that had to be removed with a solvent stripper. Because of the difficulty in handling large parts without damaging the masking material at the edges, it is generally the practice to cut sheet stock oversize and then trim the damaged edges at the end of the process.

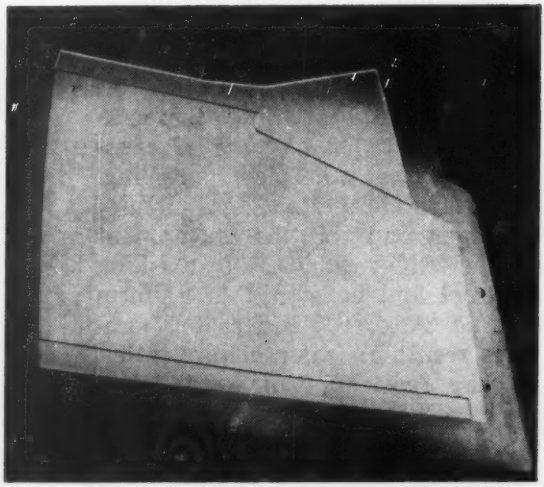

Fig. 2—Typical aircraft production part contoured and chemically milled. Part shown here was provided by courtesy of Texas Aircraft Milling Corporation, Dallas, Texas.

Before parts processed by this method could be used in structural applications in aircraft it was necessary to determine the properties of chemically milled surfaces. The fatigue characteristics of parts chemically milled were compared with those of mechanically milled parts. Chemically milled parts were found to have acceptable fatigue characteristics so long as a certain surface smoothness was maintained. The requirement has been set at a maximum of 125 microinches.

Certain etching solutions are found to give pitting in the end-grain of aluminum alloys. The slightest of such flaws causes a decrease in the structural strength of a part, and any sign of pitting or intergranular corrosion is cause for rejection of the part. In general, a determination of the surface roughness and a visual observation of end-grain appearance is sufficient final inspection. Inspection methods and quality standards have been determined only after extensive testing of the effect of roughness and end-grain condition on the structural characteristics of the metal.

For the most part, aluminum is chemically milled in a caustic solution, although acid etchants are also being used to a limited extent. Equipment required for the caustic bath is the simplest. Mild steel tanks with steel coils may be used. Thorough ventilation must be pro-

vided to carry away the caustic fumes and hydrogen generated in the vigorous reaction.

Most of the initial development work was done on chemically milling aluminum, but at the present time, in addition to aluminum, both magnesium and stainless steel are being chemically milled in increasing amounts. Titanium has also been successfully chemically milled, and if that metal comes into more prominent use in the future, it is certain that chemical milling of titanium will also become a common process.

An acid bath is used to etch magnesium, stainless steel, and titanium. This requires more expensive materials of construction. Several of these processes use etching materials that give high rates of etch. Cooling of the solution, rather than heating, is required to maintain adequate control. Stainless steel tanks installed with refrigeration equipment comprise a typical installation for etching magnesium. Because of the excessive corrosion of stainless steel by acid solutions at elevated temperatures, a tank made of chemical brick is recommended.

The applications for chemical milling are already many and varied. Sheet stock may be thinned uniformly and rapidly by chemical milling, since metal is removed from both sides simultaneously.

Stepwise etching may be effected quite simply by masking, etching, and then removing additional masking to give a second plateau. Any number of such etching and mask removal steps may be made to obtain complex, stepwise cuts.

It is also a simple matter to make tapered sections by the chemical milling process. It is necessary only to remove the part uniformly from the etching solution to obtain a carefully controlled taper. In some cases deep, rather than long tanks, have been installed for etching to produce long tapered sections.

Chemical milling can expand in several directions. It is expected that more and more magnesium and stainless steel will be chemically milled in the future. At the present time the process is almost completely restricted to the aircraft industry, which was responsible for its development, but it is expected that other industries will make use of its potential when its use is more generally known. It is possible that the automotive industry will find a use for chemical milling, with more and more aluminum being used. In any event here is a new and growing process that has a bright future.

—Adapted for publication in PRODUCTS FINISHING from a paper presented before the Chicago Branch, A. E. S.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

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Math for Painters

By RICHARD R. BOUTALL

The Varnish Products Company
Cleveland, Ohio

Calculations and terminology that every finisher should understand

The other day one of our salesmen rushed into my office saying he was about to lose his newfound account because his customer was unable to get the desired viscosity and coverage with our recommended reduction. After assuring the salesman that the material sent to his customer had been checked carefully, I told him we would straighten out the situation.

Before seeing the customer, I wanted to convince the salesman that we had done right by him, so we reduced part of the retain sample the recommended fifty per cent and, sure enough, obtained the correct viscosity. Then we went to see the customer.

We met the paint foreman and he explained that the material seemed thin and didn't hide the metal. He explained that he had reduced the recommended amount, but just couldn't get results. I told him this was difficult to understand because we had just run a check in the lab before coming.

"Well," said the paint foreman, "we reduced your white enamel just as you said. Fifty per cent. Fifty per cent enamel to fifty per cent reducer."

This confusion of terms is constantly encountered and has caused untold difficulty. Let's get this arithmetic straight.

Reduction is based on the amount of paint to be reduced, so that a

3:1 reduction is 33%, not 25%
2:1 reduction is 50%, not 33%
1:1 reduction is 100%, not 50%

You can see the difficulty that would arise if 1:1 were 50 per cent; how would you accomplish 100 per cent reduction? If reductions were reported by parts—2 parts paint to 1 part reducer, for example—there would be no confusion.

There are other calculations that paint men should understand. Per cent solids and weight per gallon should be familiar terms.

Table I shows how these figures are arrived at for an alkyd enamel:

Table I

	Dry Wt.	Total Wt.	Volume
50 per cent Solution Medium-Oil Alkyd	30.0 lbs.	60.0 lbs.	7.75 gal.
Mineral Spirits		15.0 lbs.	2.31 gal.
Titanium Dioxide	25.0 lbs.	25.0 lbs.	0.72 gal.
Totals	55.0 lbs.	100 lbs.	10.78 gal.

"Many times it is desirable to know the theoretical coverage."

$$\text{Total solids} = \frac{55.0 \text{ lbs.}}{100.0 \text{ lbs.}} \times 100 = 55\%$$

$$\text{Wt./gal.} = \frac{100.0 \text{ lbs.}}{10.78 \text{ gal.}} = 9.3 \text{ lbs./gal.}$$

Many times it is desirable to know the theoretical coverage and this is not difficult to calculate from the composition. Returning to the example, Table II shows the solids by volume or that volume occupied by each of the ingredients when all the solvent is removed.

Now if the dry components in this 10.78 gal. formula total 3.78 gal., then the per cent solids by volume equals

$$\frac{3.78}{10.78} \times 100 = 35.2\% \text{ by volume.}$$

And if every gallon is 35.2 per cent solids by volume, and there are 231 cubic inches in a gallon, it follows that there are

$$\frac{35.2}{100} \times 231 \text{ cubic inches/gal.} = 81.2 \text{ cubic inches of dry ingredients in each gallon.}$$

***RICHARD R. BOUTALL** is a chemical engineering graduate of Case Institute of Technology. He has been director of research and technology at Varnish Products for 11 years.*

Table II

	Dry Weight	Volume of Dry Wt.	Formula Volume
Med. Oil Alkyd (@ 9.8 #/gal.)	30.0 lbs.	3.06 gal.	7.75 gal.
Mineral Spirits	—	—	2.31 gal.
Titanium Dioxide (@ 34.9 #/gal.)	25.0 lbs.	0.72 gal.	0.72 gal.
Totals	55.0 lbs.	3.78 gal.	10.78 gal.

To determine the theoretical coverage or spread, say at one mil film thickness, convert cubic inches/gal. to sq. ft./mil/gal. as follows:

$$\frac{81.2 \text{ cubic inches}}{\text{gal.}} \times \frac{1 \text{ (square foot)}}{144 \text{ square inches}} \times \frac{1}{0.001 \text{ in. (1 mil)}} = \frac{81.2}{0.144} =$$

563 sq. ft./gal. at 1 mil.

This value could also be reported

for one half mil thickness, in which case it would be doubled — 1126 sq. ft./gal./½mil. Simple multiplication can be used to calculate any other desired film thickness.

Theoretical coverage can also be calculated by determining the solids and weight per gallon in the laboratory and then estimating the weight per gallon of the solvents.

Let's say the laboratory results were 9.3 lbs./gal. and 55 per cent solids by weight, just as shown in the example. Now we know from using this enamel that it reduces with mineral spirits, so we will say that the solvent has an approximate weight of 6.5 lb./gal.

So the product must be 45 per cent solvents, if 55 per cent is solids, and weight of solvent is

$$\frac{45}{100} \times 9.3 \text{ lbs./gal.} = 4.18 \text{ lbs.}$$

and occupies a volume of

$$\frac{4.18 \text{ lbs.}}{6.5 \text{ lbs.}} = 64.8\% \text{ of a gallon.}$$

This means the dry solids occupy 35.2 per cent of the space or 81.2 cubic inches as in the other calculation. To get the spread you again convert as before.

It must be explained at this point that this spread value is theoretical and does not take into consideration overspray, evaporation, spillage, variation in thickness, and so on. The actual spread will be less.

Perhaps one more point should be brought out and that is, in pigmented products, if all the pigment solids were removed and replaced with resin solids, the theoretical coverage would increase. However, the hiding would be nil.

When reporting solids, one usually reports per cent solids by weight or per cent non-volatile. While this has been the generally accepted way, it does not tell as much about a product as weight of solids per gallon or per cent solids *by volume.*

Per cent solids *by weight* and per cent non-volatile can be increased in some cases by using a heavy, low-bulking inert pigment such as blanc fixe, but such a material does not increase spread appreciably. Likewise, in some formulations, it is possible to use heavier or lighter solvents and yet keep per cent dry weight the same (by varying the *volume* of solvent used accordingly). The spread increases or decreases when this is done, but this is not reflected in the per cent solids *by weight,* which remains the same. It is necessary to calculate per cent solids *by volume* to show the difference.

Let's go to the example once more, and replace mineral spirits with xylol, the per cent solids and total weight being equal (Table III).

Table III

	Total Wt.	Dry Wt.	Volume
50% Solution Med. Oil Alkyd	60.0 lbs.	30.0 lbs.	7.75 gal.
Xylol	15.0 lbs.	—	2.10 gal.
Titanium Dioxide	25.0 lbs.	25.0 lbs.	0.72 gal.
Totals	100.0 lbs.	55.0 lbs.	10.57 gal.

The alkyd and titanium will still occupy the same dry volume as in the other example, but you will notice that the total volume is smaller. Thus, the new per cent solids *by volume* will be

$$\frac{3.78}{10.57} \times 100 = 35.8 \text{ per cent by volume.}$$

This will give more spread.

Per cent solids *by weight,* however, remains the same — 55 per cent. This same kind of calculation can be shown in lacquers with acetates vs. ketones and aromatic vs. aliphatic type solvents.

So you can see that the per cent solids by volume is the value that determines the amount of spread, and perhaps we should report our products in such a way.

★ ★ ★

Test for Differentiating Stainless Steels

A spot test that can be used to identify 200 and 300 series stainless steels has been developed by the Electro Metallurgical Co., Division of Union Carbide Corporation.

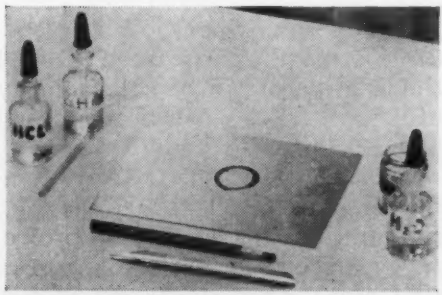
Stainless steel users and scrap dealers are often faced with the problem of identifying sheets, bars and ingots of mixed 200 and 300 Series stainless steels.

Here's how the test is done:

Reagents: Hydrochloric acid, specific gravity 1.19 (regular "concentrated" HCl); nitric acid, specific gravity 1.42 (regular "concentrated" HNO_3); sodium bismuthate; water.

Procedure: Place two drops of nitric acid followed by one drop of hydrochloric acid on the specimen to be tested. After the reaction has subsided, add two drops of water and mix with a glass stirring rod. Add a pinch of sodium bismuthate and mix with the rod. If all the sodium bismuthate dissolves, add small portions until excess reagent is present. After thirty seconds to a minute, the No. 200 Series stainless steels will give a dark reddish-brown spot, while the No. 300 Series will give a tan spot.

The operator should first familiarize himself with the test on known specimens of 200 and 300 stainless steels. On sheet material, a ¼- to ½-inch diameter dimple made in the material with a blunt nose punch confines the area of the test and makes it much easier. Or the operator can confine the reaction area by drawing a one-inch circle with a grease pencil.



Chemicals and apparatus needed to differentiate 200 and 300 Series stainless steels. Sample piece has been prepared using a grease pencil to form circle, but plate can be "dimpled" with hammer and blunt nose punch as alternate method to confine test area. (Photo courtesy Electro Metallurgical Co., Div. of Union Carbide Corporation.)

A Missile-Maker's Titanium Plating Process

By C. W. HANDOVA
Materials Research Section
Missile Development Division
North American Aviation, Inc.
Downey, Calif.

The Missile Development Division of North American Aviation has developed a plating process that produces electrically-conductive coatings that won't chip or peel from titanium and its alloys.

Silver-plated titanium is particularly important in missile construction. It permits the efficient use of titanium's excellent strength-weight ratio in parts which must conduct current in the 200 to 400 megacycle bands. Depth of current flow is 150 to 200 millionths of an inch.

In addition, where no high structural strength is required, plated titanium parts can be satisfactorily utilized at service temperatures well above 900 deg. F.

Because of its inertness at temperatures up to about 1000 deg. F., titanium doesn't have to be protectively finished for the same reasons that most other metals are plated. But certain coatings increase the material's usefulness by eliminating galling and seizing tendencies which make the metal hard to fabricate; preventing scaling at the high temperatures specified for heat treatments, power plant applications, and so on; making it possible to use the metal where good electrical conductivity is required, as in electronic equipment; permitting the assembly of titanium and related components with solder; facilitating the reclamation of parts that have been overmachined or otherwise reduced to less than allowable dimensions.

Getting good plating on titanium is difficult, however. Hard-to-remove oxide films form quickly, prevent satisfactory adhesion of the plated coatings. And titanium is very susceptible to hydrogen embrittlement.

North American gets around these problems by a series of cleaning and activation procedures and by using a combination of electroless-nickel-plated and conventional-plated coatings.

Pre-processing is especially critical in the preparation of titanium for plating. If all oxides have been removed immediately prior to the initial plating operation, parts go into the electroless nickel solution with a layer of nascent hydrogen atoms, which plays a catalytic role and assures the proper bonding of the plated coating.

Conventional mechanical clean-

Process details on a method of producing adherent plated coatings that make strategic titanium even more valuable . . .

ing removes dirt and other contaminants — everything except the oxide film, which reforms immediately. To activate the titanium parts just before they enter the electroless nickel, the following procedure is used:

1. Immerse in a solution of three parts 69 per cent nitric acid and one part 60 per cent hydrofluoric acid. Leave in this bath until red fumes are evolved.
2. Rinse in distilled or deionized water.
3. Immerse in a solution of sodium dichromate, hydrofluoric acid and distilled water for 20 minutes at 180 to 212 deg. F.
4. Rinse in cold running water.

Because no one coating can be expected to impart all the characteristics required of a plated coating for titanium, the process involves a series of plating operations—during which nickel, copper, silver, and gold are deposited.

Nickel is first applied by means of an electroless (chemical reduction) method in order to obtain a base coating with good mechanical adhesion to titanium. Copper is used primarily as a base for the adherent deposition of silver, which is functionally the most important part of the finish. The final gold coating prevents oxidation of the silver.

A standard electroless process developed by Chemplate Company, Los Angeles, has been used with good results in producing nickel plating on titanium.

Electroplating methods subsequently employed in the deposi-

Fig. 1—Titanium cone is among the missile components that have been made from plated materials by North American Aviation.

tion of copper, silver, and gold are more or less conventional.

Nickel and copper coatings are applied in thicknesses of 0.001 to 0.002 inch. The depth of silver plating is 0.002 to 0.0025 inch, while the final gold coating is only about 0.000050 inch thick.

Parts should be transferred from tank to tank as rapidly as possible in order to minimize the possibility of contamination.

Fatigue tests made with commercially pure titanium parts thus plated have been conducted at 50 per cent of the yield strength at temperatures of minus 100 deg. F. to plus 700 deg. F. Tensile tests have indicated no detrimental effects that might be attributed to plating.

Adhesion tests — hundreds of cycles—have failed to cause peeling or cracking, and coatings on bend-test specimens have remained intact up to the point where parent materials failed.

For practical purposes, parts with areas up to five or six square feet have been both internally and externally finished without difficulty. There have been no titanium rejects caused by plating since the new process was approved for production usage.

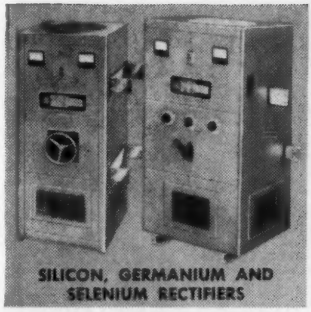
Fig. 2—Titanium sheet is lowered into an electroless nickel plating bath. This step provides an adherent coating that forms a base for subsequent plating by conventional electrolytic methods. (Photographs courtesy Missile Development Division, North American Aviation, Incorporated, Downey, California.)

A Survey of Paint Application Methods

A series of articles on painting methods have been reprinted as a 64-page booklet.

Chapters in the report cover: 1) Use of the Spray Gun. 2) Conveyorized Spray Finishing; Automatic Spraying; Electrostatic Spray Painting. 3) Hot Spray; Airless Spraying; Steam Spray Painting; Spraying Catalyst Coatings. 4) Dipping Methods; Flow Coating. 5) Roller Coating; Tumble and Centrifugal Painting; Silk Screening; Aerosol Painting.

Reprints of *A Survey of Paint Application Methods* are available at 50 cents a copy. Write to PRODUCTS FINISHING, 431 Main St., Cincinnati 2, Ohio.



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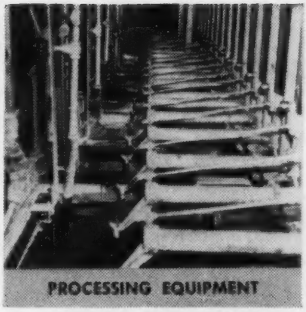

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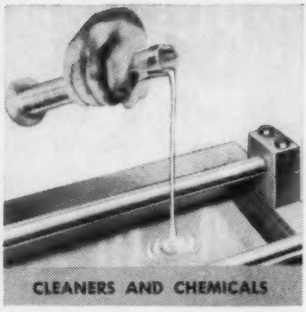

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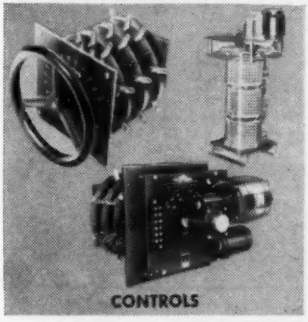

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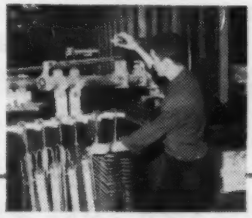

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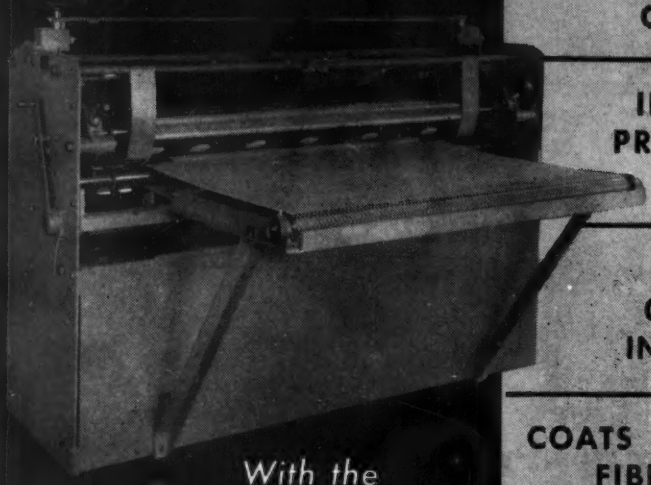

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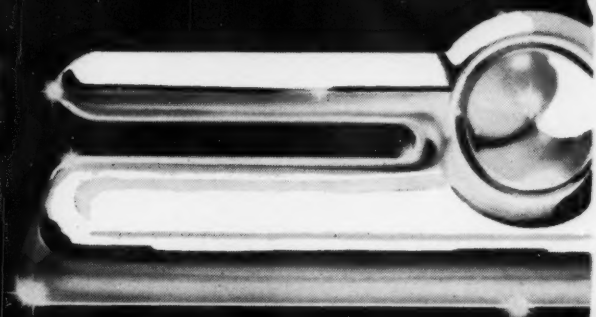

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White Marks on Plated Parts

Question: *We are faced with a problem of white marks formed on our barrel nickel plated parts. We use a watts-type bath with cadmium chloride as a brightener.*

We are enclosing two parts, one nickel plated and the other flashed in brass and lacquered.

Is it possible that this may be grease pitting? If so, what can be used to remove the grease from solution?

J. E. T.

Answer: The white marks on the nickel plated parts may be caused by grease. You should clean carefully and acid dip to remove all possible grease from parts or handling baskets before the parts go into the nickel solution. If grease does collect on the nickel solution, it can be removed by collecting it on brown paper placed on the solution surface at the start of each day's operation or at other times when the barrel is not in operation.

A more successful method might be to use wetting agents or brighteners in the nickel solution.

If you would like to secure only a wetting agent and continue to use cadmium chloride as a brightener, contact the companies listed on page 178 of the PRODUCTS FINISHING DIRECTORY under the heading "Surface Active Agents."

For immediate assistance, you might be interested in contacting some of the distributors or plating supply dealers in your area. These are listed in the PRODUCTS FINISHING DIRECTORY on page 281.

★ ★ ★

Hot-Dip Galvanizing

Question: *We have been asked to galvanize steel nails, 1¼ inch by 3 inches long, but we do not know the proper procedure for this process.*

Would you give us the information, step by step, together with the tanks required, solution concentration, temperature and immersion time.

G. L. L.

Answer: You will need a galvanizing kettle, which is a gas-fired or an electrically heated tank sufficiently strong to hold molten zinc and operate at 750 deg. F. In addition, you will need cleaning and acid dipping equipment which you probably already have for use with your plating processes.

I am enclosing a copy of an article entitled "Modern Hot-Dip Galvanizing" which contains additional information.

Have you considered the possibility of applying a very heavy electroplated coat of zinc in your zinc barrel plating equipment? The nails thus coated could be dipped in a chromate conversion solution for additional protection.

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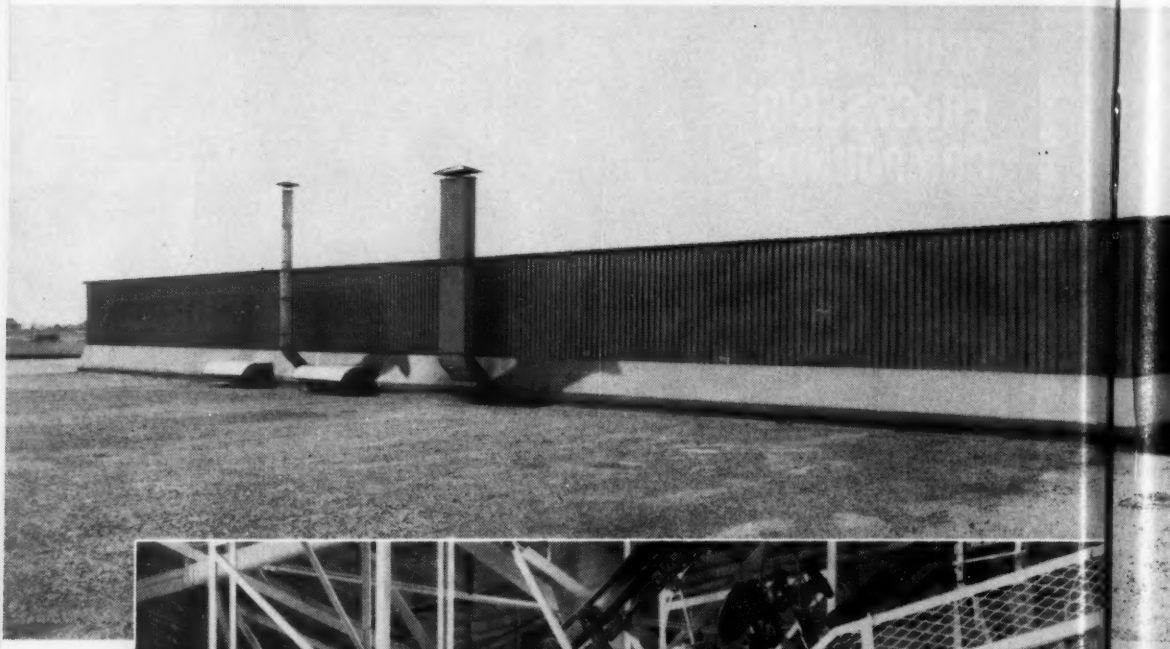

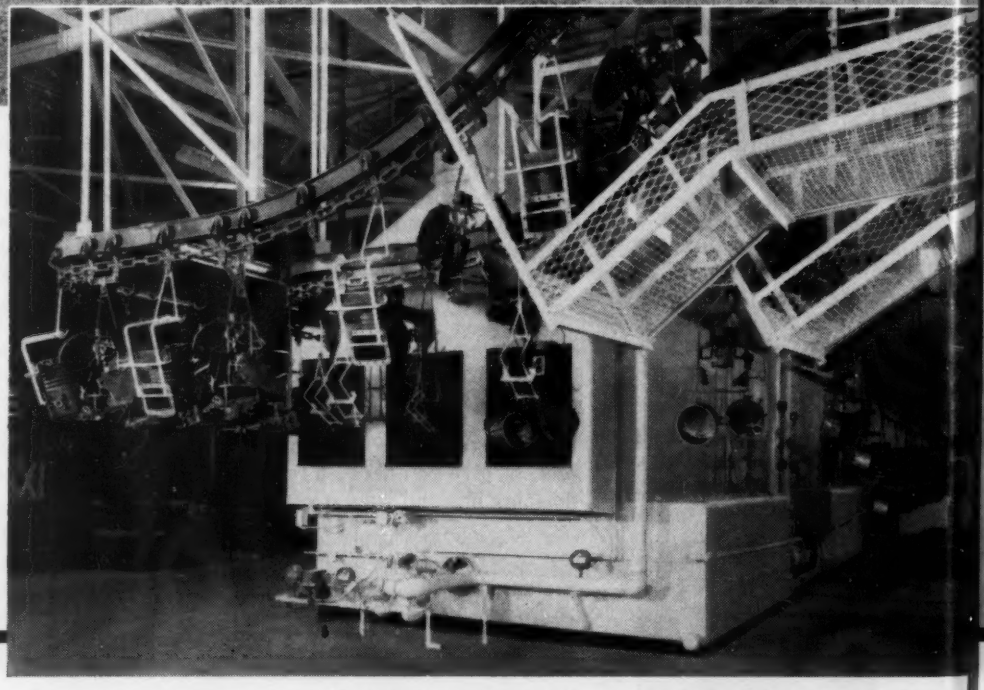

The Mahon Dehydrating Oven (top) was installed on the Roof to Conserve Space Inside the Plant. Below: Three Conveyor Line Two-Stage Metal Cleaning Machine—Another Unit of Equipment in the Modern Compressor Processing Facilities in the Copeland Refrigeration Corporation's Plant, Sidney, Ohio.

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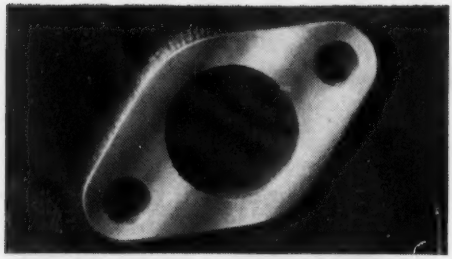
Barrel Finishing Stainless Steel Hex Nuts

By CHARLES G. TUVEK
Pratt & Whitney Co., Inc.
West Hartford, Conn.

If proper steps are taken, surface roughness will not interfere with the development of a high color by barrel finishing methods. The part illustrated by the accompanying photograph had heavy inside diameter and outside diameter burrs which were formed when the part was punched from sheet stock.

The part was barrel finished to a smooth finish and a high color by the following process:

1. Rough out parts in ⅜ by ¼-inch aluminum oxide ceramically bonded shapes at 18 r.p.m. barrel speed. Keep the water level low. Use an alkaline barrel finishing compound.
2. After cut down, transfer to ½ by ⅜-inch chips and scrub parts for one hour using a mild abrasive compound.
3. Rinse thoroughly and run five minutes using a general cleaner.
4. Overflow rinse and flush.
5. Leaving water level high, add



Esbec No. 203 and 3 to 4 ounces Esbec No. 134, and run from one-half to one hour.

As can be noted in the accompanying photograph, this treatment produces a high luster and color. Investment castings and forgings also may be colored while in the rough condition by this method.

★ ★ ★

Why Engineers Chose Black Enamel for 3600-m.p.h. Space Ship

When the U. S. Air Force X-15 rocket ship takes off in the first scientific attempt to crash through the earth's outer atmosphere into space . . . and return . . . with man at the controls, a new era in flight will have been inaugurated.

Every engineering detail of the

North American's X-15: Manned rocket ship painted all black, for better heat radiation

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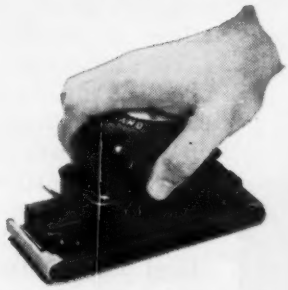
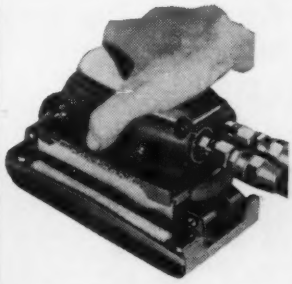
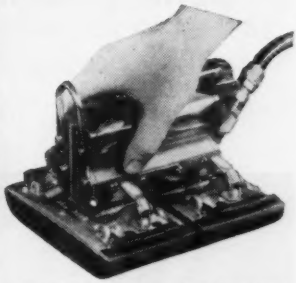


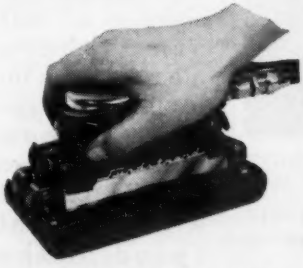
OS-800—lightest weight orbital air sander on the market, at only 3 lb, packs the power and speed needed for production jobs.



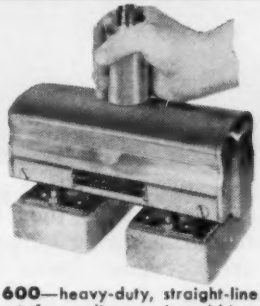
OS-700—single-pad orbital sander, weighing 5 lb, operates over 6000 cycles per minute.



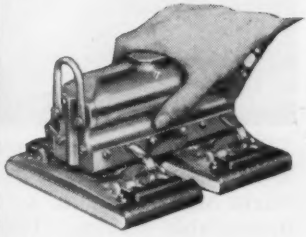
1000—straight-line sander with big abrasive area, operates at 2500 oscillations per minute, palm lever control, 7½ lb.



SP-101—straight-line, single-pad sander, 3000 oscillations per minute, 5 lb.



600—heavy-duty, straight-line unit for sanding, pumice rubbing, or polishing, 1100 oscillations per minute.



4000—straight-line, two-pad sander with longer, slower stroke, 2100 oscillations per minute, 9 lb.

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Paint for the X-15 . . .

X-15 is important—even its exterior black enamel. Why paint this hypersonic aircraft black?

Engineers of North American Aviation, designers and manufacturers of the X-15, say that the black enamel was chosen for its heat resistance and heat-radiation properties. The black enamel was manufactured by Rinshed-Mason Co. of Anaheim, Calif.

Before a planned program of research flights are completed, it is expected that the X-15 will reach speeds about 3600 m.p.h., or roughly 6 times the air speed of sound.

Its mission is to carry man into the ionosphere for the first time. Heights of better than 100 miles above the earth may be achieved. Problems at these altitudes are numerous—lack of air, lack of gravitational pull, cosmic rays, possible flying meteors—but the most critical phase is the ship's re-entry into the earth's atmosphere.

As the ship encounters resistance of our atmosphere, aerodynamic heating begins. Atmospheric pressures in wild conflict with the great speed of the plane will be so severe at this barrier, as the X-15 plunges earthward, that leading edges and other portions of the ship are expected to

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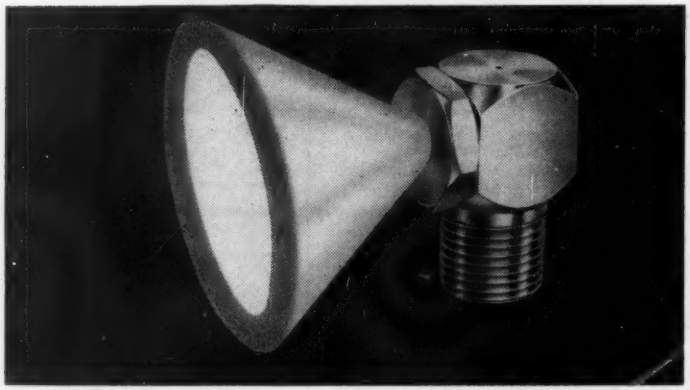

This outstanding nozzle can operate effectively at pressures as low as 5 psi. Made of 316 stainless steel, the 2172 WR offers high resistance to corrosion, assuring longer, more dependable service. There are no vanes, cores or other obstructions to promote clogging.

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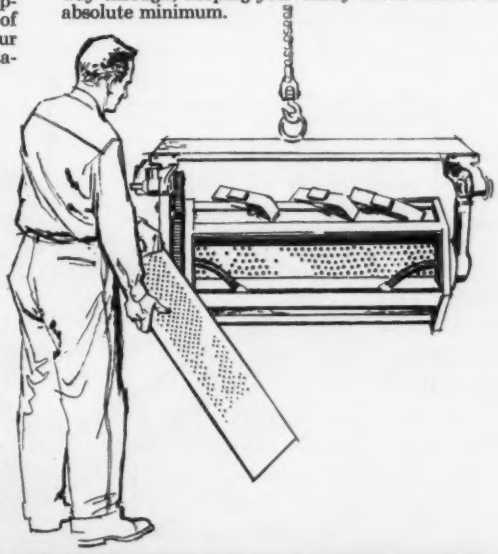
When your equipment is sent to us, you will be guaranteed a firm return delivery date. Because a special department will handle your order all the way through, keeping *your* costly down time to an absolute minimum.



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reach temperatures of approximately 1200 deg. F.

Concentrated friction with the air at re-entry causes the heat to build up throughout the plane's structure, and of all colors, black radiates heat at the fastest rate. The problem is not one of *reflecting* heat away from the surface, such as the sun's rays. Aerodynamic heat is *absorbed* heat.

It is the same basic reason that automobile radiators are painted black and why room-heating steam radiators should be, though seldom are.

Short of Space? Put the Finishing System on the Roof!

New complete finishing system at Hamilton Manufacturing takes roof route, requires no additional floor space . . .

Putting the factory roof to work is often a good "way out" when a new finishing system is required and floor space is scarce.

The complete finishing system engineered and built by R. C. Mahon Co. for Hamilton Manufacturing Co., Two Rivers, Wisconsin, is a good example of such a system. Expansion via the roof approach

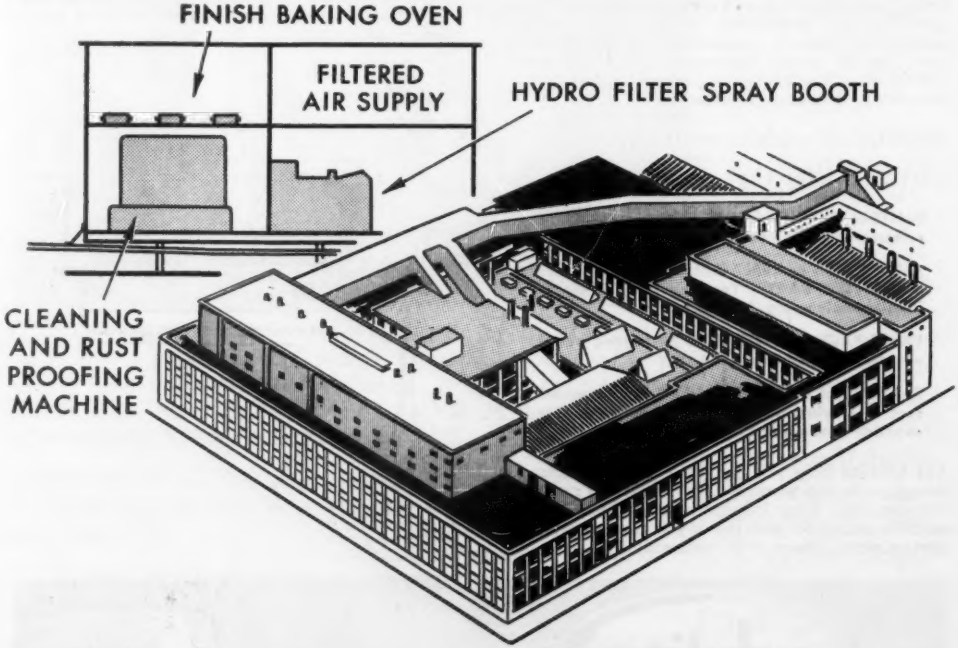

Fig. 1—Drawing shows layout of complete finishing system at Hamilton Manufacturing Co., Two Rivers Wisc. System is mounted on roofs, hops from roof to roof through tunnels. Drawing at upper left is end view of structure enclosing finishing setup.

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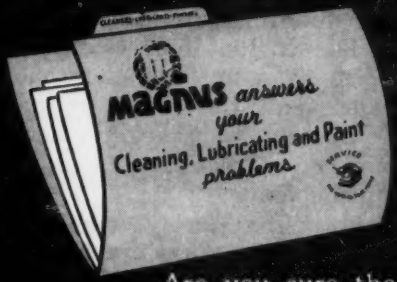

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here "recovered" more than 30,000 square feet of additional production space at a cost far less than the cost of revamping existing finishing operations.

Hamilton produces dental equipment, laboratory cabinets, medical and surgical furniture and clothes dryers.

The new finishing unit is a complete, self-enclosed system. It is built above the company's steel-fabricating section and is connected by a network of conveyor tunnels which passes over roofs of various buildings and dips down into fabricating and assembly areas.

The conveyor tunnels are extensions of three continuous conveyor lines. One of these lines is about a half-mile in length. A complete circuit on this conveyor requires about four hours if the conveyor is running at its normal speed of 10 feet per minute.

The 27-foot-high roof enclosure occupies a space 221 by 55 feet, houses all the finish processing equipment, from cleaning and preparation of metal surfaces to final finish baking.

To operate the system at capacity all three lines are loaded with parts to be finished. The three lines travel to one place, then begin to parallel one another, moving in the same direction. They all go through a six-stage washing and pretreat-

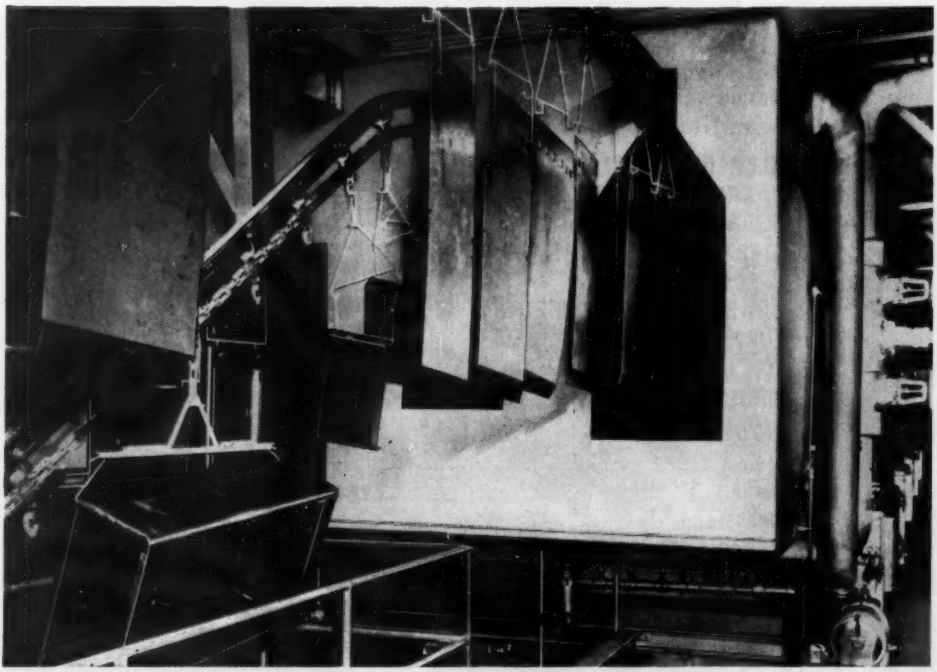

Fig. 2 — This big six-stage washer cleans parts moving through on three conveyor lines simultaneously. Heavy piping is used to handle large volume of processing solutions required by the machine. (Photographs courtesy R. C. Mahon Company, Detroit.)

Sylvania's new catalog of vacuum metallizing coils lists 164 shapes and sizes. Most of these have become standards for efficiency in the applications for which they were designed.

Whether your interest is in finished coils or top-quality stranded wire, if you form your own coils, Sylvania can help you.

Here's how to find the one coil that's best for you

Sylvania can help analyze your coil needs if you supply us with the following information:

1. What type and weight material is being evaporated?
2. What material is being coated?
3. What is the length and diameter of your equipment?
4. What is the power supply to the coil and the distance between electrodes?

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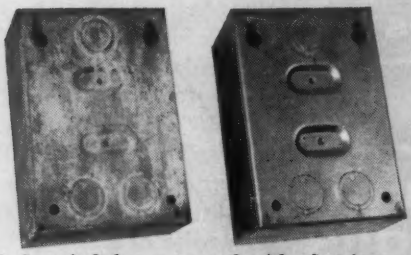

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ment machine and then through a dry-off oven. From the oven all three lines enter an air-conditioned finishing area.

The first line is used for finishing light-gauge metal home laundry dryer parts. It travels through two electrostatic spray booths in succession to assure good coverage. Parts then travel through a 30-foot hand-spray booth, where areas not well covered by electrostatic spray are reinforced. Parts then go to the oven, where the finish is baked at 280 deg. F. for 45 minutes. The finished parts then go to assembly.

This line loops around a spray booth where black paint is being applied in such a way that parts such as kick boards and back panels can be removed from one side prior to entering the area where white enamel is sprayed; these parts are hung back on the same conveyor traveling in the opposite direction on the other side of the spray booth. This permits the parts that must be finished in black to complete the finishing cycle and arrive at the assembly line on the same conveyor carrying the white parts.

The second line at Hamilton carries large formed and welded units. It travels parallel to the first line until it enters an 87-foot conventional spray booth for manual spray operations. This line also leads to the baking oven and later to assembly.

The third line, which carries parts similar to the second, travels the same path as the other conveyors until it nears the first spray booth. Here it departs from the course and travels through an exit tunnel to another part of the plant. Parts on

this conveyor are painted using equipment that was in use before the new system was installed.

★ ★ ★

Van der Horst Evaluates Titanium Tubing for Heating and Cooling Chrome Solutions

The most practical material for in-tank heating and cooling of chromic-acid plating solutions is titanium tubing, according to findings of Van der Horst Corporation of America, Olean, N. Y.

Van der Horst has conducted its investigation of tubing for heating and cooling plating tanks as part of a general program aimed at increasing the serviceability of its equipment. As developers of Porus-Krome —a process for applying to cylinder walls and other hard-wearing surfaces a hard chrome plate with pores for holding lubricating oils— the firm has become one of the largest chromium platers in the world and operates plants in both the United States and Holland. With a heavy investment in plating and accessory equipment, the company continually looks for means of extending equipment life.

The most satisfactory method of heating and cooling chromic acid solutions, Van der Horst has found, is through heat exchangers. Either steam or water is pumped through tubing which has been bent in the form of a hair pin and immersed in the solution.

The primary requirement for the tubing is ability to resist corrosion

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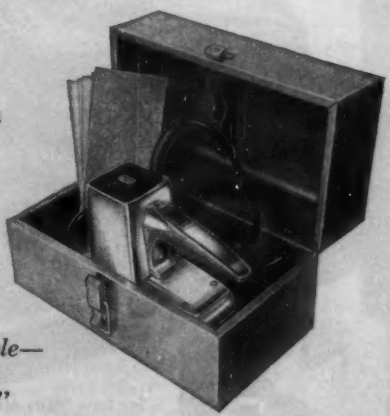

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by the 25 per cent chromic-acid solution. If the tubing should corrode through, the plating solution would be seriously diluted and might even be lost by siphoning action or overflow.

Another important tubing requirement is good heat transfer properties. The tubing material should not only be a good conductor but also should have comparatively thin walls to facilitate heat transference. At the same time, the tubing must be able to withstand the steam pressure (15 p.s.i.) and water pressure (100 p.s.i.).

Finally, the tubing must have sufficient ductility to withstand bending into the U-shape without cracking.

One of the first materials used by Van der Horst was lead tubing. It had the necessary corrosion resistance and was easily formed. However, it proved so ductile that it required considerable support to prevent bending where not wanted, and the softness of the metal made it subject to damage from fixtures in the tank and other causes. Weak spots made it susceptible to bursting from momentary high steam pressures, and it had poor heat transfer.

Steel tubing has also been used but only as a temporary heating

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RSW-13

Style	Length	Material	Weight	Grip
Nimble Fingers V-10	10½"	Pylox Vinyl	Sheer	Non-Slip
Stanzoil RSW-13	10½"	Milled Neoprene	.018 (dbl)	Non-Slip
Sheergrip 0754	10½"	Natural Latex	.020 (dbl)	Smooth
Sheergrip 0794	10½"	Natural Latex	.025 (dbl)	Non-Slip
Sheergrip 0763	18"	Natural Latex	.023 (dbl)	Smooth
Sheergrip 4773	34"	Natural Latex	.035 (dbl)	Smooth
Sheergrip 7852	10½"	Neoprene Latex	.019 (dbl)	Smooth
Sheergrip 0808	7½"	Natural Latex	.020 (dbl)	Smooth

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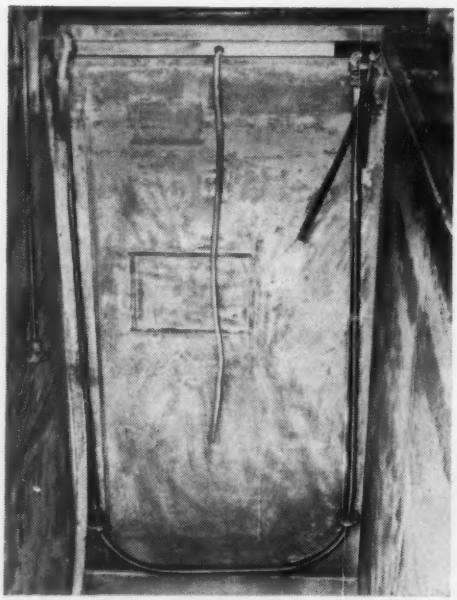
and cooling device. It cannot be used as a permanent accessory because the welds eventually corrode and the fittings (usually cast iron) corrode rapidly.

The most satisfactory material used prior to titanium was tantalum tubing. Its principal disadvantage has been uncertainty of supply.

Van der Horst engineers now see titanium tubing as the probable answer to their problem (although they will wait until it is in service two more years before making a final evaluation). It is just as inert to the chromic acid solution as tantalum, and delivery is no problem.



Bent titanium tubing used for heating and cooling chromic acid solutions is shown here in an empty tank. Stirrer shown at left of the photograph helps to keep temperature uniform throughout the solution. (Photograph courtesy Superior Tube Co., Norristown, Pa.)

Van der Horst uses one-inch outer diameter, 0.020-inch wall, grade A-40 seamless titanium tubing. It is supplied by Superior Tube Company, Norristown, Pa. Grade A-40 is specified because it is the most ductile titanium commercially available in tubing form.

Thus far the tubing has been used in five plating tanks, each of which holds 25 per cent chromic-acid plating solution. The tubing—some of which has been in service more than a year—has shown no evidence of attack by the acid.

Van der Horst receives the tubing in 15-foot minimum lengths. It is soft annealed for maximum formability. The tubing is filled with Woods metal and then bent on a conduit bender to the "hair pin" configuration. After the Woods metal has been removed the bent tubing is installed by connecting to water and steam pipes.

All joints of the tubing are kept above the plating solution, while the tubing itself reaches almost to the bottom of the tank. This guards against leakage of steam or water into the tank, which might result from corrosion at the joints.

Van der Horst also uses titanium tubing for wells for temperature control sensing elements in the plating tanks. Here, too, there has been no evidence of corrosive attack on the metal.

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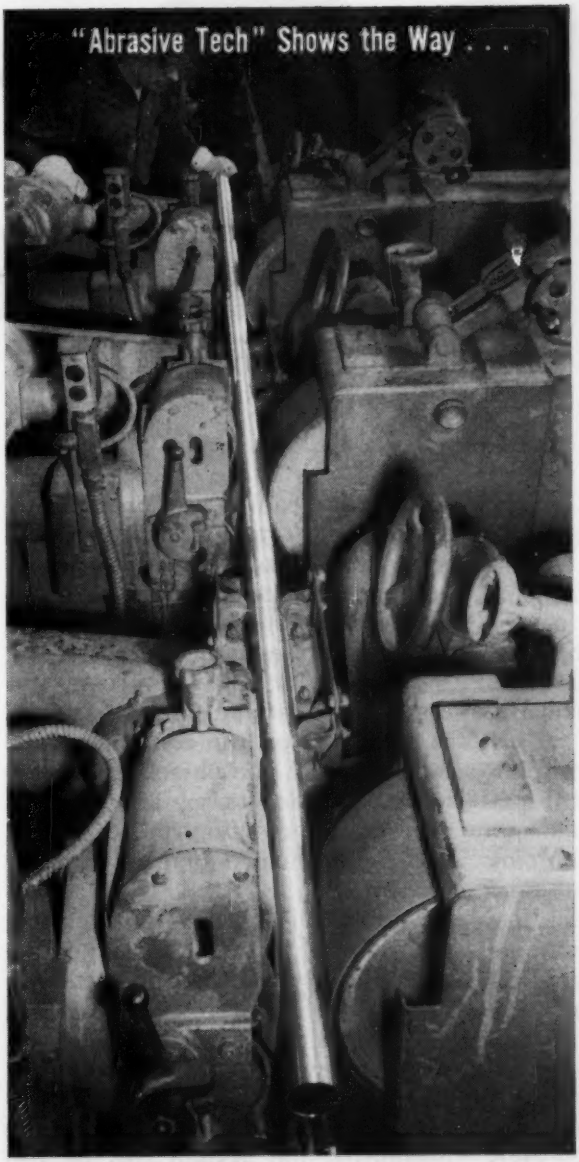

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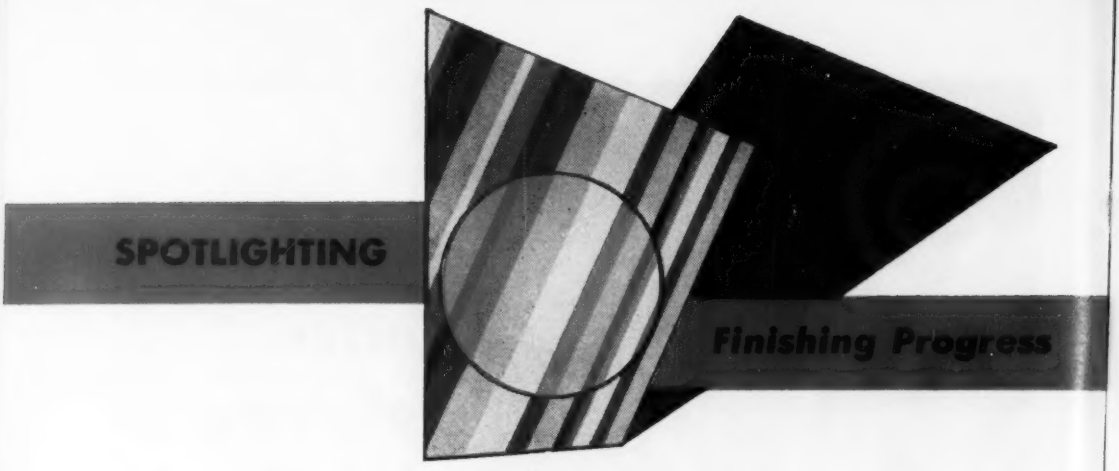


Studies of Electroless Plating

Increased understanding of the conditions favoring "electroless" nickel plating has resulted from recent research at the National Bureau of Standards.

The electroless process for plating nickel and cobalt on metal surfaces was developed a decade ago by the Bureau. It is similar in many respects to electroplating but does not employ an electric current.

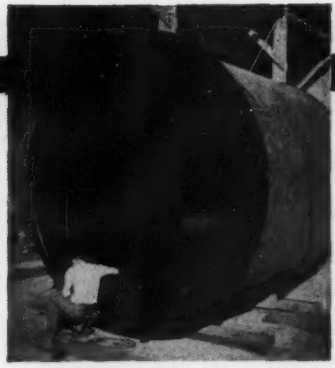
Although adapted by a number of industries for specific applications, electroless plating has not been systematically studied to any great extent. To obtain further information on the nature of the deposition, C. de Minjer and Dr. Abner Brenner of the Bureau's electrodeposition laboratory have been investigating the variables that affect the rate of nickel plating and the degree of protection that the coating provides.

Unlike electrodeposition, electroless plating can be used to build up smooth, uniform coatings to a definite thickness over irregularly shaped objects, without producing nodular deposits on edges and corners—throwing power is not a factor.

In other chemical processes for depositing metallic films, the metal is deposited on the container walls as well as on the objects immersed in the solution; also, after several minutes, the reaction runs to an end and the exhausted solution must be discarded.

With this electroless plating process, however, a nickel coating is deposited only on certain catalytic metals, such as iron, nickel, cobalt, and palladium; deposition does not occur elsewhere in the bath. Furthermore, by periodically replenishing the bath with the appropriate chemicals, the system can be run continuously for hours or even days. Since the reaction is autocatalytic, that is, the nickel itself catalyzes the process, the deposition continues once a nickel surface is obtained on any object. Non-catalytic

Series 105



TANK LINING QUIZ

Will your present tank lining meet all ten conditions below? It will, **and more,** if it's...

Amer-Plate
PVC TANK LINING

	Yes	No
1. Will it adhere directly to concrete without costly metal interlining?	☐	☐
2. Will it withstand hard chrome liquor to 160° F.?	☐	☐
3. Is it unaffected by strong acids and oxidizing materials?	☐	☐
4. Is it resistant to highly corrosive salts?	☐	☐
5. Will it resist alkalis, including 50% caustic soda?	☐	☐
6. Is it insoluble in aliphatic alcohols, glycol and glycerine?	☐	☐
7. Is it impervious to diesel oil, sour crude, aliphatic petroleum hydrocarbons?	☐	☐
8. Is it non-toxic in food and beverage service?	☐	☐
9. Is it also supplied with T-ribbed back, for casting into place in new concrete tanks?	☐	☐
10. Are expert applicators available in all major cities?	☐	☐

If your present tank lining material scores NO on any point that is important to you, it's time to consider the lining that passes ALL the tests... AMER-PLATE POLYVINYL CHLORIDE SHEET! For complete information and name of nearest applicator, write:

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metals can be made catalytic by immersion in a dilute solution of palladium chloride, which coats the metal surface with an almost invisible film of catalytic palladium.

Electroless nickel deposits are not pure nickel but consist of a nickel-phosphorous alloy containing about eight per cent phosphorous. The deposits are bright and much harder than pure nickel deposits.

The electroless process involves the reduction of hot nickel salt (such as the chloride or sulfate) solutions with pure sodium hypophosphite. An organic acid such as glycolic or citric acid is added to the bath as a combined buffering and complexing agent. Actually the reaction utilizes only about one-third of the hypophosphite reducing power because a concurrent reaction between the hypophosphite and water produces hydrogen and phosphite.

Experiments were conducted to determine the rate of deposition at various pH values. Although the acidity increases during operation of the bath, it is not feasible to control the pH during the plating. Instead, a relatively large volume of the bath (1 liter), is used to plate a relatively small specimen (having an area of only 12 square centimeters). Under these conditions, the change in hydrogen ion concentration is not significant. The original electroless bath deposits coatings at the rate of only a few tenths of a mil per hour. Rates of the order of one mil per hour are desirable.

An increase in the acidity of the bath considerably reduces the rate of plating. For example, a decrease in the pH of the bath from five to four halves the rate. Ordinarily a higher pH could be maintained by continually adding alkali but the upper value of the pH is limited by the precipitation of nickel phosphite. This reaction is undesirable because the presence of a precipitate leads to spontaneous decomposition of the bath; thus the optimum pH of the electroless bath is

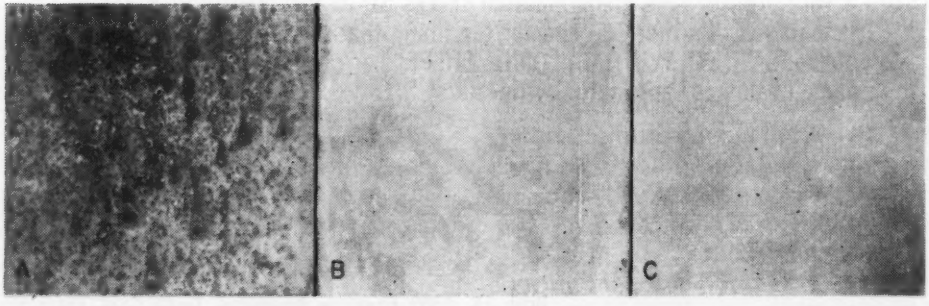
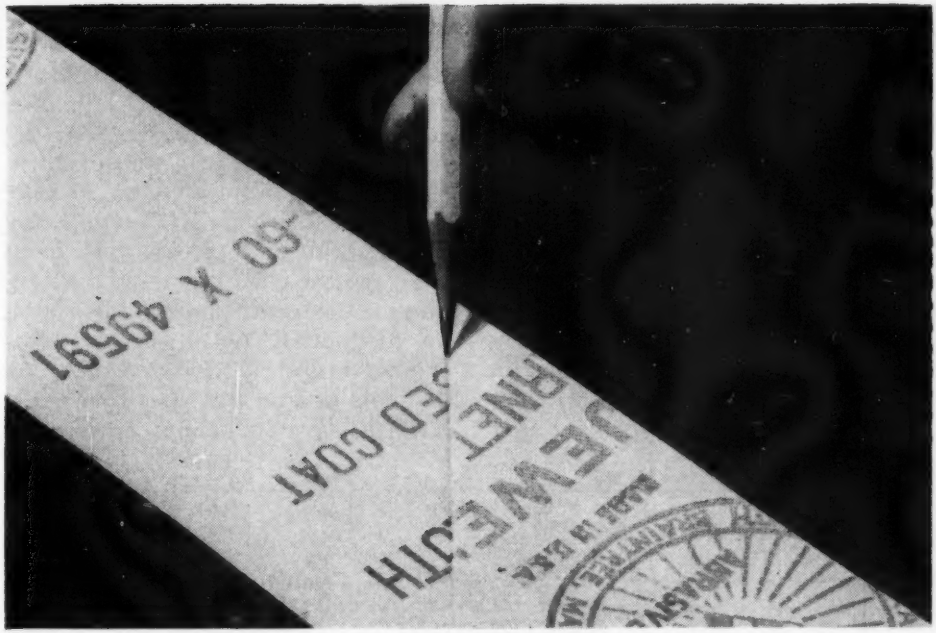


Fig. 1—The effect of weathering on electroless nickel plating as compared to other types of nickel-coated steels. Electroless nickel plate (b) withstood the 15-month exposure with very little corroding, as did the electrodeposited nickel coat with nine per cent phosphorous (c). However, sample coated with straight electrodeposited nickel (a) rusted markedly.



How to make both ends meet . . . and still cut finishing costs!

Time was when abrasive belt joints raised a rough problem in finishing circles. The early overlapping joints caused belts to rotate unevenly, chatter and mar freshly finished surfaces. Not so now! Today, Jewel Brand "Velvet Joints" have put the "smooth" back in smoothing operations. Jewel Brand Belt ends are neatly blended to form velvet smooth joints which permit an even flow of cutting surfaces and eliminate jumping. The result is a smooth, uninterrupted action that speeds up grinding, finishing and polishing . . . helps keep product finishing costs in line. A Jewel Brand Engineer will be glad to demonstrate these superior belts in action in your plant without obligation. Arrange for a free demonstration now. Write Abrasive Products, Inc., 509 Pearl Street, South Braintree 85, Massachusetts.

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limited at the lower level by the decrease in the rate of nickel deposition and at the higher level by the diminishing solubility of nickel phosphite. The most satisfactory pH for the acid bath was found to be between 4 and 4.5.

The organic acids used for the buffering and complexing in the baths were found to have specific effects on the rate of deposition. Hydroxyacetic (glycolic) acid yields a higher rate of deposition than most of the other acids, with the exception of lactic acid. However, the lactic acid bath is not as stable and produces rougher deposits. The rate of deposition reaches a maximum at a specific concentration for each acid. Since the acids do not change the chemistry of the reaction, they may influence the rate through adsorption on the active nickel surface; thus the maximum in the rate curve can be explained on the basis that a low adsorption of the acid accelerates

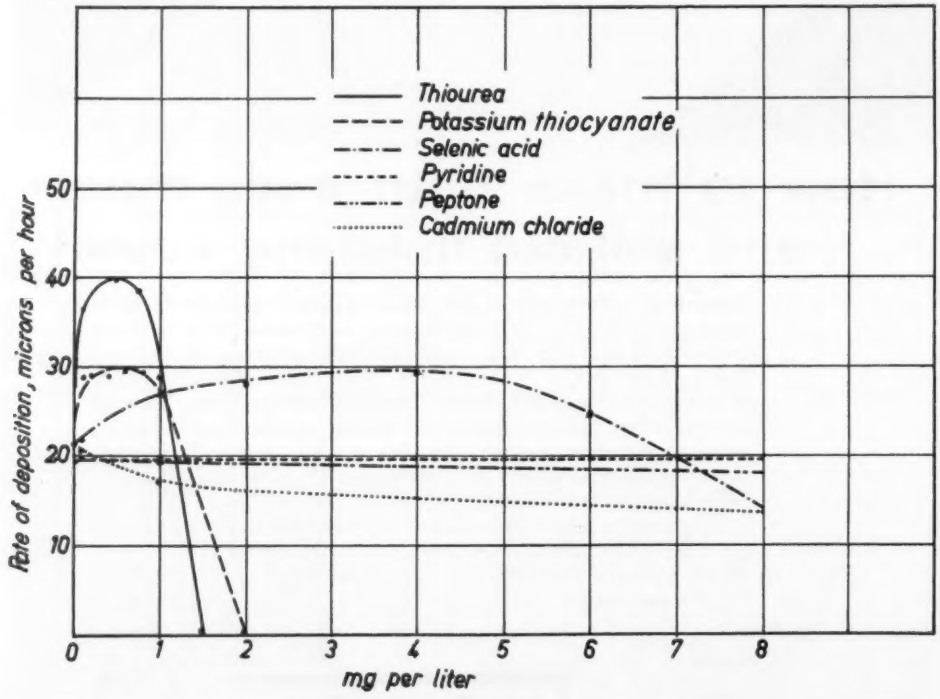

Fig. 2 — Graph showing the influence of various substances on the rate of electroless nickel plating. These compounds, which normally inhibit the chemical reaction, accelerate the process when added in minute quantities. With thiourea, a maximum rate almost twice that of the corresponding bath without the inhibitor is reached. Selenic acid yields a somewhat broader maximum than either the thiourea or potassium thiocyanate. Pyridine had little effect on the rate while cadmium chloride caused the rate to decrease steadily with increase in concentration. (Photographs courtesy National Bureau of Standards.)

CIRCO DEGREASERS

MODEL OP2

- ***Will last twice as long!***
- ***Reduce solvent costs 30% or more!***
- ***Cut labor costs!***
- ***Up to 40% less maintenance!***

NOTE THESE FEATURES . . .

1. **Unobstructed tank walls.** Condensing coil and condensate pan are recessed providing superior vapor control, effective solvent reclamation and unobstructed working area.
2. **Demand type water control.** Insures using water only when needed, thereby reducing operating cost. Placement of nickel plated condensate coils in conjunction with new type water control eliminates water condensation along the sidewalls of degreaser, thus, preventing rusting of the sidewalls and acid solvent, increasing the life of the degreaser.
3. **New pump design.** All pump parts are fabricated of stainless steel. The rotor and end plates are nickel clad. Rotating magnetic field drives impellor, thus, the pump is completely sealed except the intake and outlet, preventing leakage.
4. **Lower height.** Working height reduced for easy operation.
5. **Built-in storage tank.** Holds adequate reserve for flushing in addition to entire contents of degreaser sump.
6. **Less floor space.** Designed to operate from either side.

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the reaction while a high adsorption poisons the catalytic surface.

The effects of other reagents upon plating speed were determined in attempting to correlate over-voltage and rate of plating.

In theory, electroless plating involves a two-step process. In the first step, hypophosphite is catalytically decomposed to release hydrogen. In the second step, energy liberated in the discharge of hydrogen is transferred to the nickel ion. This energy activates the nickel ion so that it can react with the hypophosphite ion. The nature and rate of hydrogen release determine the rate and efficiency of deposition.

The hydrogen overvoltage on a metal surface may be taken as a measure of the ease of hydrogen liberation on the surface. A low overvoltage should facilitate the discharge; however, the energy produced for activating the nickel ion would also be low. The hydrogen should possess more energy for activation if released from a high-overvoltage surface but its discharge would occur less readily. Consequently, some intermediate overvoltage should be the optimum for the deposition of nickel.

The suggestion that there should

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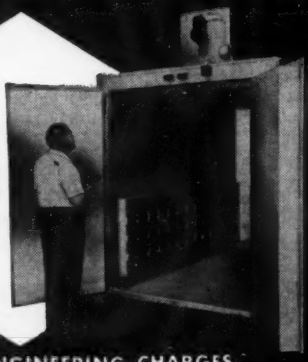

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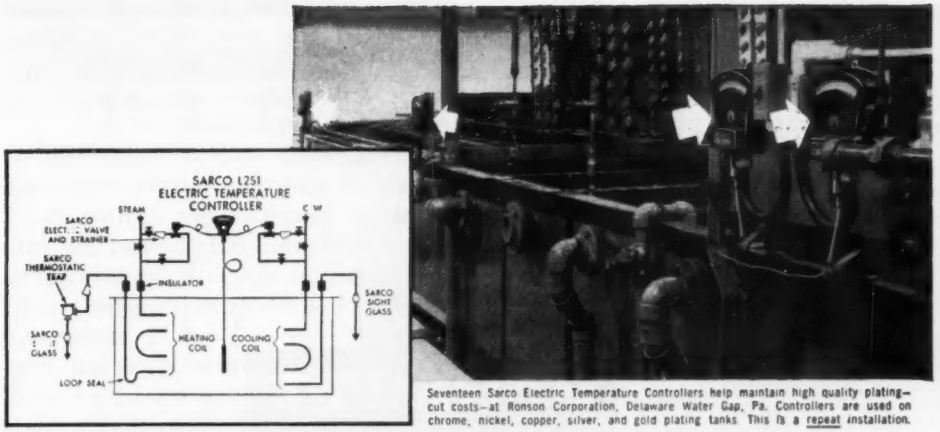

Seventeen Sarco Electric Temperature Controllers help maintain high quality plating—cut costs—at Ronson Corporation, Delaware Water Gap, Pa. Controllers are used on chrome, nickel, copper, silver, and gold plating tanks. This is a repeat installation.

Improve plating quality—cut your costs with low-cost temperature control

Unstable bath temperatures . . . the result of erratic manual temperature control . . . are sure to lead to costly rejects, wasted man-hours and breakdown of plating solutions.

You can solve these problems at *low cost* . . . by installing always-reliable Sarco Automatic Temperature Control. Just think . . . a complete Sarco System is yours for as little as $130 a tank!

1. **You improve plating quality** because creeping temperatures are a thing of the past.
2. **You lower rejects** because solutions are held automatically to pre-set temperatures. No chance for human error to mess up a tankload . . . and cut into profits.
3. **You get better utilization of time**—platers are able to concentrate on their plating work. No worrying about bath temperatures. No turning on and off of valves.
4. **You save plating solutions**—because automatic control prevents boil-off caused by overshooting temperature.

Write for Bulletin 1025-B or consult your plating supplies jobber. Sarco Company, Inc., 635 Madison Avenue New York 22, N. Y.

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A COMPLETE SYSTEM FOR AS LITTLE AS $130 A TANK!

Think of it . . . automatic temperature control that often pays for itself in weeks!

Easy-to-read controller dial clearly indicates temperature being maintained. Temperature setting quickly changed by turning one knob.

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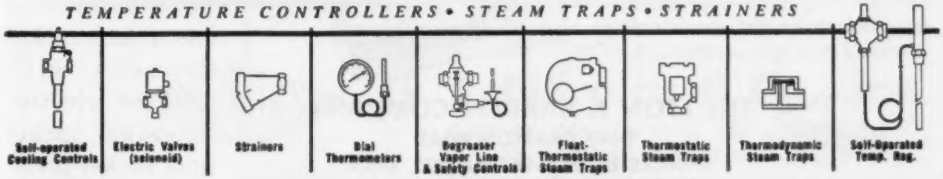

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be a correlation between overvoltage and rate of plating led to a study of the influence of certain reagents on electroless plating.

Although the correlation between overvoltage and the plating rate was not actually established, it was found that small concentrations of certain addition agents appreciably increased the rate, slightly higher concentrations decreased the rate, while still higher concentrations prevented deposition.

Certain substances, classified as catalytic poisons, in concentrations of about one part per million parts of solution markedly raised the rate of deposition. As with organic acids, the effect of these substances reached a maximum at a certain concentration. Thiourea and potassium thiocyanate gave the most significant effect. The former greatly increased the rate of deposition, producing a noticeable effect even in a concentration as small as 0.1 mg/l. It has not been determined whether these additives can be used in practical plating operations.

Outdoor exposure tests were made of plated steels to compare the protective value of electroless nickel deposits with that of electrodeposited nickel and nickel-phos-

BARRETT *Centrifugal* **DRYERS**

For DIFFICULT DRYING JOBS and Heavy Loads up to 425 lbs.

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RUGGED CONSTRUCTION provides for years of constant use with virtually no downtime or maintenance.

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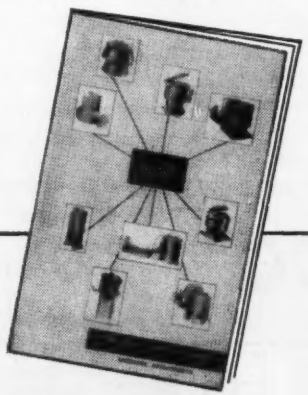

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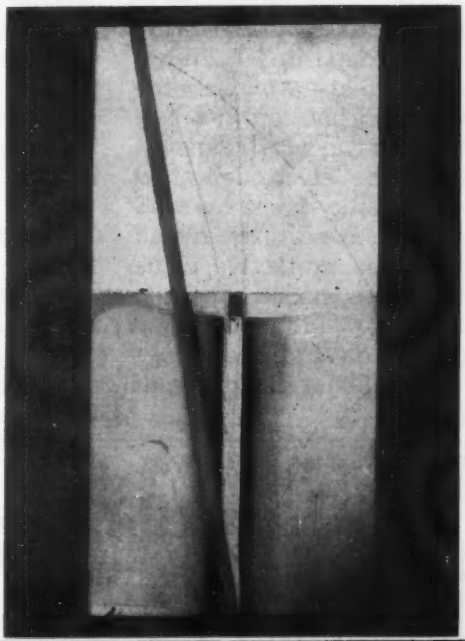

QUALITY THAT SPEAKS FOR ITSELF—The upper half of the above silver plate was finished with Nikolas 2105 Clear Lacquer; the lower half with competitive recommended clear silver lacquer. A rubber band was placed over the two finishes and in two weeks the free sulphur had penetrated the competitive material with the above results.

The same results can be expected when testing No. 2105 Clear Lacquer for Hardness, Mar-resistance and Discoloration from direct sunlight.

The finest plated goods are protected by Nikolas Clear Finishes.

Eye Appeal Sells Your Product!

Sixty-Seven Years of manufacturing know how available for any of your finishing problems.

NIKOLAS

G. J. Nikolas & Co., Inc.

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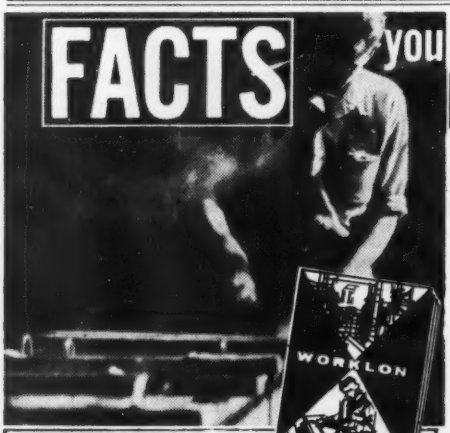
phorous alloys. Samples were prepared from both acid and alkaline types of electroless baths. Results showed that electroless nickel coatings from acid baths offered steel greater protection against rusting than did electrodeposited coatings. Although somewhat tarnished, the electroless plates had only a few rust spots at the end of a 15-month period, while the electrodeposited nickel of the same thickness and under the same conditions rusted considerably. The protective value of the electroless nickel deposits was equivalent to that of the electrodeposited phosphorous alloys which contained about nine per cent phosphorous.

Electrodeposited Metallic Coatings. A compilation of A.S.T.M. Standards B-8. Order from A.S.T.M. Headquarters, 1916 Race St., Philadelphia 3, Pa. 124 pages. Price, $2.25.

This compilation of standards covers such materials as electrodeposited zinc, cadmium, nickel, chromium, and lead for steel. In addition, coatings for copper, copper base alloys, zinc and zinc base alloys are covered. This 1958 edition supersedes the previous issue in 1955.

Local thickness, acetic acid, and salt spray tests are included in this volume.

To make the book more complete and of greater use to industry and government, recommended practices for preparing metals for plating are included.



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Fact #1 — Acids, caustics and other damaging chemicals spell speedy **ruin** for ordinary work clothes of cotton or wool.

Fact #2 — **Worklon** industrial apparel, specially made of DuPont Dacron, Union Carbide Dynel and DuPont Orlon, actually **resists** acid and chemical deterioration . . . resists this damage up to **50 times longer** than ordinary garments. This has been **proved** time and time again by government and industry usage tests.

Fact #3 — The use of Worklon industrial apparel **saves as much as 93%** on your yearly work clothes costs. This, too, has been **proved** year after year in hundreds of plants and laboratories from coast to coast. To confirm the tremendous savings that Worklon affords, send for new illustrated catalog and comprehensive laboratory reports—yours **FREE!** Also included is an informative section on **lint-free** acid and caustic resistant clothing. Mail coupon today!

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announcing a new service to

production supervisors

of metalworking plants

With this issue, The Dow Chemical Company begins a special series of important advertisements on a subject of dollars-and-cents interest to people in manufacturing.

Subject: metal cleaning

These advertisements summarize, for quick reading, an interesting variety of reports on specific metal cleaning problems and applications. Each report comes from one of Dow's solvents distributors who serve industry throughout the United States. We hope these reports will be helpful to manufacturing people concerned with improving metal cleaning and finishing operations, and selecting the right metal cleaning agent for a specific job.

The series begins on the following pages with "Metal Cleaning Report No. 1" in which a new service for users of industrial solvents is offered for the first time. This service provides invaluable technical assistance to every plant with a metal cleaning operation. (In addition, you'll find a complete listing of Dow solvents distributors for easy reference.)

DOW

THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN

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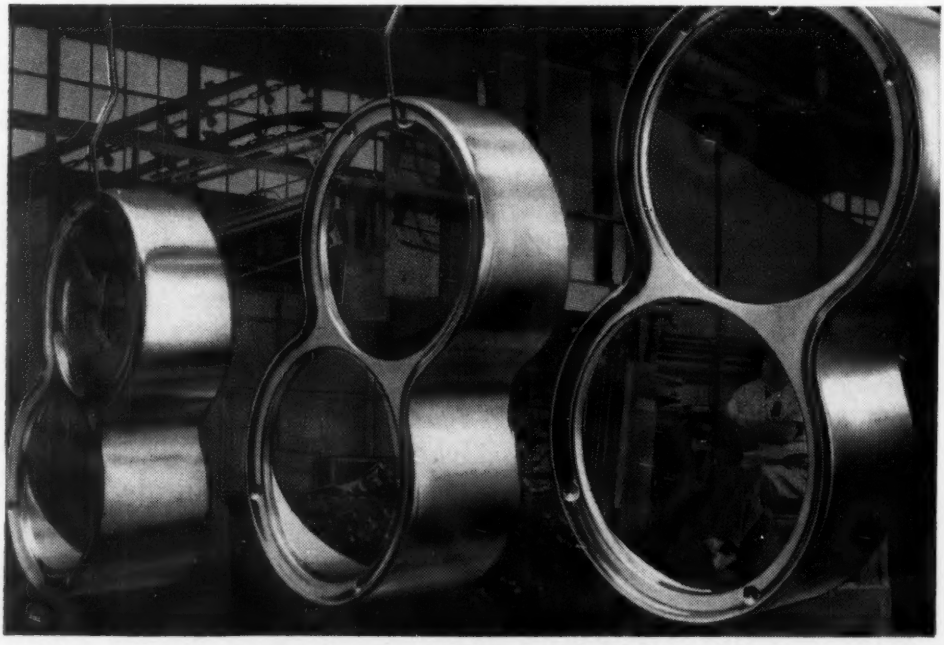
DOW

metal cleaning report no. 1

case histories from your Dow Solvents Distributor



Aluminum headlight assembly being cleaned in vapors of Dow trichloroethylene.

DOW FIELD-LAB TEAM SOLVES DEGREASING RIDDLE

Bay City, Mich.—Manufacturer of auto parts reported faulty still was causing dirty distillate in his trichloroethylene degreasing operation. Dow field team went in, did thorough check of whole operation. Discovered not one, but three trouble spots: (1) Water separator on degreasing unit working improperly; (2) Excess water in stamping oil on parts being cleaned (Dow lab finding); (3) Faulty steam injection valve on still. Valve replaced, water separator repaired, and new stamping oil put in use. Plant now getting good cleaning action first time through vapor degreasing unit using Dow trichloroethylene. Key to solution was skill and thoroughness of trained Dow solvents team.

Time and time again, Dow solvents distributors help manufacturers improve cleaning and stripping operations. And for two good reasons: (1) Dow offers the widest line of chlorinated solvents for modern industry; (2) Dow backs its distributors to the hilt with technical information and on-the-job help. Chances are good that one of the many Dow industrial solvents can help smooth out your operations, too. Dow solvents are made to high purity standards and each is designed to do a specific job and do it well. For help on your metal cleaning problems call on the nearby Dow solvents distributor. His name is listed on the next page.

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

NEW COLD CLEANER SAVES BIG DOLLAR

Detroit, Mich.—Expensive fluorinated cleaner was being used by manufacturer to remove paraffin oils from refrigeration compressors. Key requirement: clean parts without damaging insulation varnish on motor windings. Dow solvent team invited in. Observations pointed to Chlorothene® (Dow 1,1,1-trichloroethane, inhibited). Compressors cleaned with Chlorothene and air purged immediately after. Lab tests proved Chlorothene cleaned effectively, safely, without damaging insulating varnish. Company switched to Chlorothene, effected real savings and got safe, sure cleaning.

PERCHLOROETHYLENE KEY

Los Angeles, California—Nationally known lock manufacturer was having difficulty cleaning plated metal parts. Door handles and face plates were coming off trichloroethylene degreasing line with marring water spots. Dow called in on problem. Recommended switch to Dow perchloroethylene. Higher boiling point and longer cleaning action resulted in spotless parts. Lock maker now saving time, money, with efficient perchloroethylene degreasing.

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TECHNICAL SERVICE
on 24-hour notice

Your Dow solvents distributor will gladly help you with any problems you're experiencing with metal cleaning solvents. He'll have a trained solvents specialist en route to your plant within 24 hours after your call is received!

Ask your Dow solvents distributor for details.

STOP-OFF LACQUER STRIPPED FAST

Stratford, Conn.—Major aircraft engine manufacturer was having trouble removing stop-off lacquer used on steel and aluminum parts selectively plated. Parts were being soaked and rinsed in flammable thinner. Process was slow, results unsatisfactory. Dow distributor suggested vapor degreasing with Dow methylene chloride. Parts were run through vapors, then rinsed with spray lance application of m.c. System worked. Lacquer stripped off clean in matter of minutes. Flammability hazard eliminated. Problem marked solved.

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TRICHLOROETHYLENE
PERCHLOROETHYLENE
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DOW

FOR HELPFUL METAL CLEANING INFORMATION

get in touch with your Dow Solvents Distributor

LETTER KEYS:

(C)—Chlorothene®; **(M)**—Methylene Chloride; **(P)**—Perchloroethylene (Industrial); **(T)**—Trichloroethylene

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BIRMINGHAM—F. H. Ross and Company (C M P T)
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MOBILE—McKesson & Robbins, Inc. (C M P T)
MOBILE—F. H. Ross and Company (C M P)
MONTGOMERY—Wittichen Chemical Company (C M P)

ARIZONA

PHOENIX—Braun Chemical Company (C M P T)
PHOENIX—Western Chemical Company (C M P)
TUCSON—Western Chemical Company (C M P)

CALIFORNIA

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INDIANAPOLIS—Wm. Lynn Chemical Company (C M P)
INDIANAPOLIS—Lynn Solvents Corporation (T)
INDIANAPOLIS—Ulrich Chemical Company, Inc. (T)
KOKOMO—Plating Products, Inc. (P T)
LOGANSPORT—Plating Products, Inc. (P T)
SOUTH BEND—Inland Chemical Co. (C M P T)
SOUTH BEND—Stevens Oil Company (C M P)

IOWA

BETTENDORF—Barton Naptha Company (C M P T)
BURLINGTON—McKesson and Robbins, Inc. (C M P T)
CEDAR RAPIDS—McKesson and Robbins, Inc. (C M P T)
COUNCIL BLUFFS—Barton Solvents, Inc. (C M P T)
DES MOINES—Barton Naptha Company (C M P T)
SIOUX CITY—McKesson and Robbins, Inc. (P)
SUMNER—Overton Chemical Sales (C)

KANSAS

WICHITA—Barada and Page, Inc. (C M)
WICHITA—Reid Supply Company (C P T)

KENTUCKY

LOUISVILLE—Dixie Solvents and Chemicals (C M P)
LOUISVILLE—Gans Chemical and Supply Company (P)
LOUISVILLE—McKesson and Robbins, Inc. (C M P T)

LOUISIANA

BATON ROUGE—Barada and Page, Inc. (C M)
LAKE CHARLES—Barada and Page, Inc. (C M)
NEW ORLEANS—Barada and Page, Inc. (C M)
NEW ORLEANS—Southern Solvents and Chemicals (C M P T)

MAINE

LEWISTON—Polar Chemical Company (C M P T)

MARYLAND

BALTIMORE—B. J. Howard Company (C M P T)
BALTIMORE—Leidy Chemicals Corporation (C M P)
BALTIMORE—Seiler Chemicals (C)
BALTIMORE—Tilley Chemical Company (T)

MASSACHUSETTS

BOSTON—Howe and French, Inc. (C M)
BOSTON—Linder and Company, Inc. (C M P T)
BOSTON—McKesson and Robbins, Inc. (C M P T)
EVERETT—Sessions-Gifford Co., Inc. (C M P T)
FRAMINGHAM—Axton-Cross Corp. of Massachusetts (C P T)
HINGHAM—Stephens & Roger, Inc. (C M P T)
HOLYOKE—Eastern Chemicals, Inc. (M)
SPRINGFIELD—Chemical Corporation (C M P T)
SPRINGFIELD—Hampden Color and Chemical Co. (C M P)
STONEHAM—Geo. Mann & Co. (C M P T)
WORCESTER—George H. Clark and Co. (C M P T)

MICHIGAN

DETROIT—Eaton Chemical and Dyestuff (C M)
DETROIT—McKesson and Robbins, Inc. (C M P T)
DETROIT—Western Solvents and Chemicals (C M P)
DETROIT—Whitfield Chemical Company (P)
EAST DETROIT—Sherwood Chemical Company (P)
ESCANABA—Haviland Products Company (C M P)
FERNDALE—Manpro Corporation (C M P T)
GRAND RAPIDS—P. B. Gast and Sons Company (C)
GRAND RAPIDS—Haviland Products Company (C M)
GRAND RAPIDS—Wolverine Solvents and Chemicals Co. (C M P)
LANSING—Carrier Stephens Company (C P)
LANSING—Wheaton Chemical Company (C P T)
LUDINGTON—P. B. Gast and Sons Company (C)

MINNESOTA

MINNEAPOLIS—W. H. Barber Company (P T)
MINNEAPOLIS—McKesson & Robbins, Inc. (C M P T)
MINNEAPOLIS—Tripoil Refining Corporation (M P T)
ST. PAUL—Lyons Chemicals, Inc. (C M P)

MISSISSIPPI

JACKSON—F. H. Ross and Company (C M P)

MISSOURI

KANSAS CITY—Barada and Page, Inc. (C M)
KANSAS CITY—Missouri Solvents and Chemicals (C M P)
KANSAS CITY—Sherwood and Company, Inc. (C M P T)

ST. LOUIS—Barada and Page, Inc. (C M)
ST. LOUIS—Independent Oil Company (C M P T)
ST. LOUIS—McKesson and Robbins, Inc. (C M P T)
ST. LOUIS—G. S. Robins and Company (C M P)
ST. LOUIS—St. Louis Solvents and Chemicals (C P T)
ST. LOUIS—Missouri Solvents and Chemicals (C M P)

NEBRASKA

OMAHA—Barton Solvents, Inc. (C M P T)
OMAHA—McKesson and Robbins, Inc. (C M P T)

NEW JERSEY

CAMDEN—Callahan Chemical Company (M P T)
EAST PATERSON—Aetna Color and Chemical Company (C M P T)
MURRAY HILL—American Mineral Spirits (C M P T)
NEWARK—American Oil and Supply (C P)
NEWARK—National Oil and Supply Company (C M P T)
PALISADE PARK—Philip A. Hunt Company (C)
VINELAND—Lirio Chemical Company (C T)

NEW MEXICO

ALBUQUERQUE—Braun Chemical Company (C M P T)
ALBUQUERQUE—Edmunds Chemical Company (C M P T)

NEW YORK

ALBANY—Eastern Chemical (C M P T)
ATHENS—Spick Products Company (P T)
BINGHAMTON—Collier Chem. (C M)
BRONX—Elco Solvents Corporation (M P T)
BROOKLYN—Enequist Chemical Company (C P)
BUFFALO—Buffalo Solvents and Chemicals (C M P T)
BUFFALO—Chemical Sales Corporation (C M P)
EDGEMERE—Hogan Industrial Supply (P T)
GLOVERSVILLE—Eastern Chemicals, S. H. Ireland Div. (C M)
LONG ISLAND CITY—Peerless Oil and Chemical (C M P T)
NEW YORK—American Chemicals, Inc. (C M P T)
NEW YORK—McKesson and Robbins, Inc. (C M P T)
POUGHKEEPSIE—Duso Chemical Company (C)
RENSSELAER—Eastern Chemicals, Inc. (C M)
ROCHESTER—Chemical Sales Corporation (C M P T)
ROCHESTER—J. H. Rae Oil Company, Inc. (P T)
SYRACUSE—Eastern Chemicals, Inc. (C M)
UTICA—Monarch Laboratories (C M P)

NORTH CAROLINA

CHARLOTTE—F. H. Ross and Company, Inc. (C M P T)
CHARLOTTE—Southern States Chemical Co. (C M P T)
GREENSBORO—F. H. Ross and Company, Inc. (C M P T)

OHIO

AKRON—Farley Solvents Company (C M P T)
AKRON—C. P. Hall Company (C P T)
CANTON—Bison Corporation (C P T)
CINCINNATI—Amsco Solvents and Chemicals (C M P)
CINCINNATI—Chipman Supply Company (T)
CINCINNATI—Herbert Chemical Company (P T)
CINCINNATI—McKesson and Robbins, Inc. (C M P T)
CLEVELAND—Man-Gill Chemical Company (C P T)
CLEVELAND—McKesson and Robbins, Inc. (C M P T)
CLEVELAND—National Solvents Corporation (C P T)
CLEVELAND—Ohio Solvents and Chemicals, Inc. (C M P)
CLEVELAND—R. W. Renton Company (C P T)
COLUMBUS—McKesson & Robbins Inc. (C M P T)
DAYTON—Industrial Chemical Products Co. (C P T)
DAYTON—Ottoson Solvents, Inc. (T)
LIMA—Thomson Chemical Company (C P T)
TOLEDO—Inland Chemical Co. (C M P T)
TOLEDO—Toledo Solvents and Chemicals (C M P)
TOLEDO—M. I. Wilcox Company (C P T)
YOUNGSTOWN—Rhiel Supply Company (C M P T)

OKLAHOMA

OKLAHOMA CITY—Barada and Page, Inc. (C M)
TULSA—Barada and Page, Inc. (C M)
TULSA—Chemical Products, Inc. (C M P T)

OREGON

PORTLAND—Van Waters and Rogers (C M P)

PENNSYLVANIA

CONSHOHOCKEN—American Mineral Spirits (C M P T)
EASTON—Lehigh Valley Chemical Company (C M P T)
ERIE—Monarch Laboratories (C M P T)
McKEES ROCK—Apex Soap and Sanitary Corp. (C P T)
PHILADELPHIA—Alex C. Fergusson Company (C P T)
PHILADELPHIA—McKesson and Robbins, Inc. (C M P T)
PHILADELPHIA—Phillips and Jacobs, Inc. (C M)
PHILADELPHIA—Pioneer Salt Company (C M P T)
PHILADELPHIA—George Senn, Inc. (C M P T)
PITTSBURGH—Carmac Chemical Company, Inc. (C P)
PITTSBURGH—Carman-Pittsburgh Company (C P T)
PITTSBURGH—Dacar Chemical Products Company (C P T)
PITTSBURGH—Ft. Pitt Chemical Company (C M P)
PITTSBURGH—McKesson and Robbins, Inc. (C M P T)
READING—R. W. Eaken, Inc. (C P T)
READING—Textile Chemical Company (C P)
SCRANTON—Scranton Chemical Company (C P T)
YORK—Industrial Solvents and Chemicals (C P T)

RHODE ISLAND

PROVIDENCE—George Mann and Company (C M P T)
PROVIDENCE—Sessions-Gifford Company, Inc. (C M P T)

SOUTH CAROLINA

CHARLESTON—Burris Chemical Company (C P T)
GREENVILLE—F. H. Ross & Co. (C M P T)
GREENVILLE—Southern States Chemical Company (C M P T)
SPARTANBURG—Moreland Chemical Company, Inc. (C M P T)

TENNESSEE

CHATTANOOGA—Chapman Chemical Co. (C M P T)
CHATTANOOGA—Wilson Sales Company (C M P T)
KINGSPORT—Chem-I-Dent, Inc. (C P T)
MEMPHIS—Chapman Chemical Company (C M P T)
MEMPHIS—C. P. Hall Company (C M P T)
MEMPHIS—Ideal Chemical and Supply Co. (C M P T)
NASHVILLE—Chapman Chemical Company (C M P T)
NASHVILLE—Wilson Sales Company (C M P T)

TEXAS

AMARILLO—State Chemical Company (C M P T)
AUSTIN—R. M. Hughes Company, Inc. (C M P T)
BEAUMONT—Arthur Dooley and Son (C M P T)
CORPUS CHRISTI—Barada and Page, Inc. (C M)
DALLAS—Barada and Page, Inc. (C M)
DALLAS—McKesson & Robbins Inc. (C M P T)
DALLAS—Texas Solvents and Chemicals Co. (C)
DALLAS—Van Waters and Rogers, Inc. (C M P T)
EL PASO—Baron Chemical Company (C M P T)
EL PASO—Braun Chemical Company (C M P T)
EL PASO—Mine and Smelter Supply Company (P)
FORT WORTH—Barada and Page, Inc. (C M)
FORT WORTH—Worth Chemical Products Co. (C M P)
HOUSTON—Barada and Page, Inc. (C M)
HOUSTON—W. H. Curtain and Company (P)
HOUSTON—Dixie Chemical Company (C M P T)
HOUSTON—R. M. Hughes Company, Inc. (C M P T)
HOUSTON—McKesson, Texas Chemical Division (C M P T)
HOUSTON—Texas Solvents and Chemicals Co. (C M P)
HOUSTON—Van Waters and Rogers, Inc. (C M P T)
LUBBOCK—State Chemical Company (C M P T)
MIDLAND—State Chemical Company (C M P T)
ODESSA—Barada and Page, Inc. (C M)
SAN ANTONIO—R. M. Hughes Company, Inc. (C M P T)
SAN ANTONIO—McKesson and Robbins, Inc. (C M P T)

UTAH

SALT LAKE CITY—Braun-Knecht-Heimann Co. (C M P)

VIRGINIA

NORFOLK—Taylor Salt and Chemical Company (C P T)
RICHMOND—Phipps and Bird, Inc. (C M P)
ROANOKE—Havnaer Supply Company (C M P T)

WASHINGTON

SEATTLE—Van Waters and Rogers, Inc. (C M P)
SPOKANE—Van Waters and Rogers, Inc. (C M P)

WEST VIRGINIA

CHARLESTON—B. Preiser and Company (C M P T)
FAIRMONT—Fairmont Machinery, Fairmont Supply (C P T)
HUNTINGTON—Cabell Chemical Company (C P T)

WISCONSIN

CHIPPEWA FALLS—Lyons Chemical (C M P T)
MADISON—North Central Chemicals (C M P T)
MILWAUKEE—McKesson and Robbins, Inc. (C M P T)
MILWAUKEE—Wisconsin Solvents and Chemicals (C M P)
WAUKESHA—Fred Portz and Son (C T)

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Wears like iron!

Actual-size photograph shows grain-like look and unusual flexibility of new SURE-TUF finish.

Amazing New LOWE BROTHERS SURE-TUF™ finish

...bakes on, dries tough, won't crack, gives metal products a "new look" that builds sales

The close-up photograph here only gives this easy-to-work baked-on enamel finish.

products a "new look" that builds sales

The close-up photograph here only gives you a hint of how new Lowe Brothers SURE-TUF really looks. You need actual samples of black and colors to judge the rich appearance, the "leather-grain" depth, the unusual durability and bendability of this easy-to-work baked-on enamel finish. Write today. Tell us to rush samples with information—or to send a Lowe Brothers finishing engineer to visit you for a first-hand discussion of how SURE-TUF can improve your metal products.

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INDUSTRIAL FINISHES

QUALITY UNSURPASSED SINCE 1870

Style-tested paints for Home and Industry

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Milwaukee, Wis. • Indianapolis, Ind.
Cincinnati, Ohio • Detroit, Mich.
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Dayton 2, Ohio

☐ Please have my nearest Lowe Brothers Finishing Engineer call on me as soon as possible.

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Metals Memos

News about metals and metal products . . .

Metallurgical Methods: 1958

Dr. Clarence H. Lorig, president of the American Society for Metals recently reported what he considers to be some of the outstanding metals engineering developments of 1958:

- Adaption for production use of the plasma jet, a device for applying high-melting-point metals and compounds to mandrels and as a coating. Metals to be deposited are injected in the form of wire or as powders into the hot (upwards of 30,000 deg. F.) stream of air, which is shot from the unit by streams of high-velocity inert gases that have passed through an electric arc. The answer to re-entry from outer space may be here.
- Two stronger steels. One is an air-cooling ultra-high-strength alloy steel in sheet form. It is formed in annealed condition, then heated and permitted to cool in air at room temperature, develops strengths up to 280,000 p.s.i. upon air cooling. Tempering treatment at lower temperature and another air cooling cycle follow. This steel has good formability, is readily welded.

  Second steel, hardly out of lab, has shown tensile strengths up to 400,000 p.s.i., good ductility down to minus 385 deg. F.
- "Explosive" or "high-energy-rate" forming. "Viscous state" is created in metal through great and rapidly applied pressure obtained from explosives or from new machine capable of developing extremely high pressures and releasing them instantly with explosive force. Method produces complicated shapes in a fraction of a second, sometimes without dies, can turn out parts now requiring very large presses.
- Making metal strip directly from metal powders. Powders are fed from hopper into carefully controlled gap between turning rolls of a compacting mill. Compacted powder leaves rolls, travels through sintering furnace, then is hot rolled and coiled. Early work has been with copper and nickel. Thicknesses: 0.050 to 0.060 inch. Widths: up to 11 inches. Rate: up to six feet per minute.

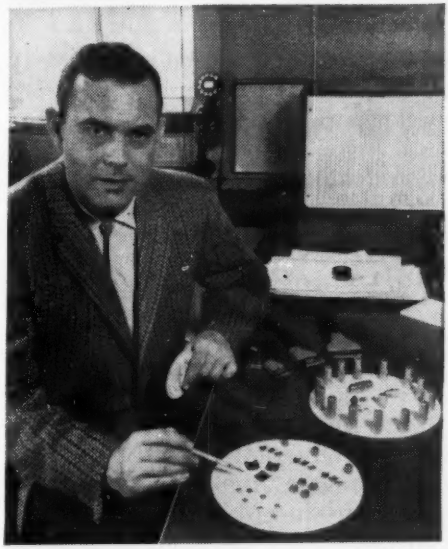
Stainless Striving

Stainless steel producers are striving to grab a larger share of huge market for metals in architecture.

In a speech before the American Society for Metals, W. B. Pierce, vice president in charge of sales for Allegheny Ludlum Steel Corporation, said "stainless steel industry is awakening to the sleeping giant in the architectural field."

Fabricators are developing techniques for producing curtain walls,

PROGRESS REPORT OF TYPICAL SCREW PRODUCTS CO....



"ALMCO barrel finishing speeds deburring, saves labor costs, stimulates new business!"

Executive of screw products company points to paint scraper nuts and coupler jaws finished with Almco machines and methods.

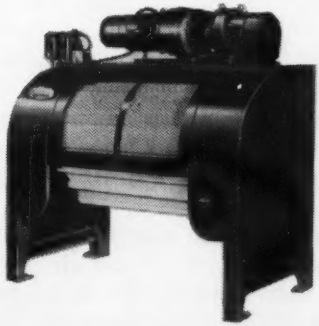
FAST, EFFICIENT FINISHING ON EVERY JOB! That's the guarantee at one hustling Midwest firm where Almco equipment has replaced hand methods. Now this job shop benefits four ways with this modern finishing method.

Parts are deburred faster and better . . . finishing costs are slashed . . . customers get swift, satisfactory service . . . parts too small for manual methods can now be profitably finished!

HERE ARE TYPICAL EXAMPLES: This shop formerly handled only 3600 paint scraper nuts a day by belt sanding, a method that left many burrs. Now 64,000 nuts may be deburred daily with Almco equipment. Savings total 97.3% over former methods, all burrs are smoothly removed.

- Grease gun coupler jaws (¼"x⅜") could not be finished manually because of small size. Now up to 40,000 are deburred in 10 hours with Almco equipment.
- Heavy burrs on push button switches could not be readily removed without barrel finishing. Now up to 10,000 per hour can be finished with Almco equipment.

GET FREE SAMPLE PROCESSING. Find out what Almco barrel finishing can do for you. Almco's technical staff will examine your product parts, run them through sample processing. You'll get a detailed report without obligation. Send in your sample parts with specification requirements.



ALMCO MODEL DB-400

The DB-400 is a medium capacity machine with a standard barrel size of 30" x 48". Barrels with 1 to 4 compartments can be furnished.

SEND FOR THIS NEW BARREL FINISHING HANDBOOK

52 pages of facts, photos, data and cost comparison charts. Write for your personal copy today.

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windows, railings, hardware, roofing and flashing that will be more nearly equal price-wise to competitive metals. Mills are helping out too, in cutting costs, by introducing a series of new developments to reduce finishing costs.

Added boost will be provided by *colored stainless,* Pierce said, with progress now being made in techniques for coloring stainless so that bright hues can join black stainless already made for curtain walls. "Color stainless will be ready in a year," he predicted.

Aluminum Adding

For aluminum, 1958 was a year of adding: added capacity, added applications.

New facilities opened in the United States during 1958 added potential capacity of 234,000 tons to carry aluminum production capacity over the two-million-ton mark for the first time, though actual production fell short of capacity. There are now six primary producers of the light metal.

Many new applications for aluminum developed in 1958, and many existing applications increased in per-unit usage of aluminum. Typical of these applications: three major aluminum bridge projects; an all-aluminum tugboat; the Air Force Academy, the largest single architectural application of aluminum in this country; several housing developments in which 2500 to 3000 pounds of aluminum are used for each home for siding, roofs, window frames, and so on; increased per-car usage of aluminum (47.3 pounds per car, average—up from 40.5 in 1957) by the automotive industry; aluminum cans; foil-paperboard laminated cartons; an all-aluminum power transformer; aluminum boat houses.

Alloy Advance

The search for alloys with high-temperature strength necessary for satisfying missile, aircraft and automotive requirements has led National Research Corporation to discovery of a new family of iron-aluminum-manganese alloys that shows promise of having long-sought properties, economical cost.

Metallurgists' analyses indicate that one of the most promising of the alloys is a "major advancement," according to an NRC spokesman. Further development work will be required to "achieve optimum composition," however.

Reasons cited for military and commercial significance of new alloy family: improved strength above 1200 deg. F., good ductility at room temperature; 20-25 per cent lighter than cobalt and nickel-base "super" alloys; heat treatment after cold working improves strength and hardness, in contrast to other alloys, which normally soften after heat treatment; good oxidation resistance to 1500 deg. F.; cold-working properties com-

What! A metal-cleaning expert? Who needs one?

You do...and here's why!

The sole function of your Wyandotte Industrial Service Representative is to help *you* in your metal-cleaning and metal-finishing operations. He is trained to show you how to use Wyandotte products most effectively — and how to cut costs at the same time!

Sound like a big order? Well, it is! But remember, your Wyandotte Industrial Service Representative is highly specialized — and his technical files bulge with knowledge gleaned from many years of coast-to-coast experience *in all phases* of metal cleaning and finishing!

What's more, your Wyandotte expert has all the advantages of product know-how and chemical research at his fingertips. This assures you of getting the very best product and the most "mileage" for your money!

So, you see, with Wyandotte you get the finest in chemical products, capable technical service backed by extensive research, and unequaled experience in metal finishing. This combination means BETTER RESULTS AT LOWER COST!

Arrange a date with your Wyandotte Industrial Service Representative, today. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Nietos, California. Offices in principal cities.*

Wyandotte CHEMICALS J. B. FORD DIVISION

THE BEST IN CHEMICAL PRODUCTS FOR METAL FINISHING

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parable to 18-8 stainless; machinability about equal to 304 stainless.

Composition of most promising alloy: 10 per cent aluminum, 34.4 per cent manganese, 0.76 per cent carbon, balance iron.

Copper Cheerful

T. E. Veltfort, managing director of the Copper & Brass Research Association, recently looked backward and forward, found copper "economically resilient, much more stable than 10 years ago."

The year 1958 began gloomily for copper, showed little improvement during the first half, with domestic copper stocks at a nineteen-year high in May, consumption reduced to 1949 levels. But copper bounced back quickly, worked off most of the surplus in a few months, set new postwar high for tonnage shipped to fabricators, in October, with 293,000 tons exceeding previous high of 262,000 tons, set in September '55.

As for the future, Copper Man Veltfort sees 1959 as a good year, with most big copper consumers doing better than in 1958. Long-term outlook is rosy, too, with growing markets such as building products (curtain walls, plumbing, sewage lines, solar heating systems), electronics, aircraft and space vehicles supplying impetus for possible new records of the '60's.

IMMEDIATE SERVICE and DELIVERY in U.S. and CANADA

America's Foremost Chemical Polishing Concentrate. Alchemize levels surfaces, producing any finish from satin to mirror-bright on otherwise impossible shapes and sizes. Want proof? We'll process **your** samples and make recommendations without charge.

Available in carboys, drums and tank trucks.

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WATER WHITE LACQUER

Daconite 5600 Water White Lacquer saves time and money on the production line, makes your product sell faster in the market.

A ready to spray clear lacquer, (Alkyd fortified) Daconite 5600 is recommended for use over blond stains, light fillers, light natural woods, Masonite and metal.

Daconite 5600 has excellent cold check resistance and produces a finish of exceptional paleness and color retention quality that will not ring from alcohol, water or hot dishes. It is highly resistant to scuffing and scratching.

5600 has been fully tested under actual market conditions. It has all the time and money saving features that assures you of production line economy as well as superior finished results.

Write for specifications sheet and testing samples on your letterhead.

DAYCO DAY SINCE 1906 FINISHES

JAMES B. DAY & COMPANY

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fine production finishes for industry since 1906.

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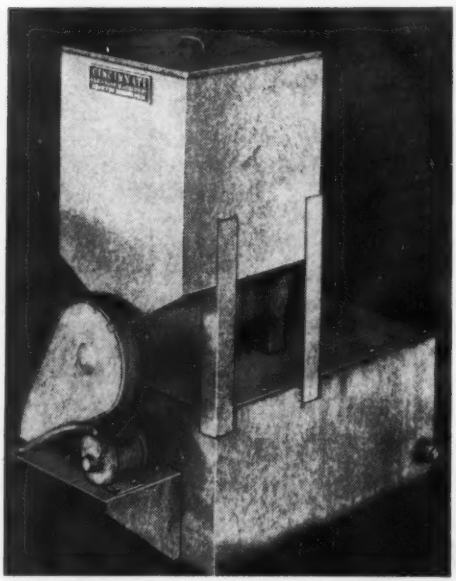
Page 88

New Equipment, Materials, Processes

Polishing, Buffing, Degreasing, Cleaning, Barrel Finishing, Plating, Anodizing, Phosphatizing, Baking, Vacuum Metallizing, Chromate Coating, Paint Finishing, Waste Treatment

Automatic Solution Replenisher

A device that automatically feeds dry chemicals and water into a tank in the proper quantities to maintain a set concentration has been introduced by Cincinnati Cleaning & Finishing Machinery Co. The unit also keeps the level of the solution at the desired point.



Cincinnati "Replenisher" (used here with a cleaning machine) automatically maintains solution concentration and liquid level

The "Replenisher" is actuated by a float valve. When solution level drops, this float valve causes a screw conveyor to feed dry chemicals into the tank in accurately measured quantities, and at the same time it opens a solenoid valve, which meters in enough water to dilute the chemicals being added.

If the dry chemicals are readily soluble, the mixing occurs without mechanical help. If not, an agitator is employed to mix the two.

Solution strength is easily and accurately variable, the manufacturer states.

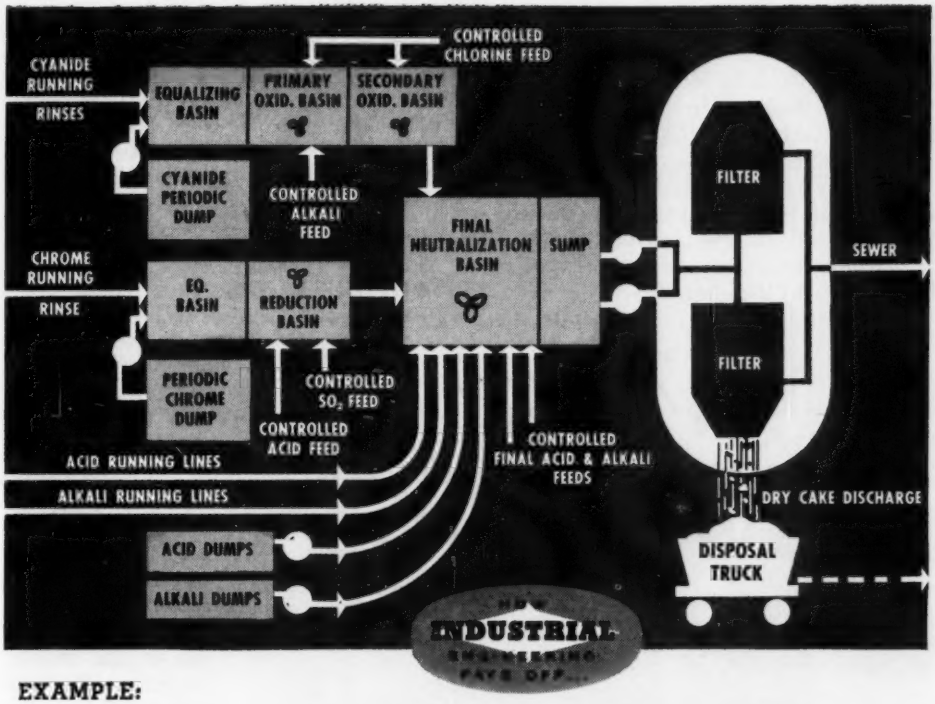
Manufacturer: Cincinnati Cleaning & Finishing Machinery Co., 2008 Hageman St., Cincinnati 41, Ohio.

For more data circle 1 on Reader Service Card

★ ★ ★

Flexible, Chemical Resistant Paint Coating

A paint recently introduced by Grand Rapids Varnish Corporation has excellent flexibility, good adherence to rubber and other elastomeric materials, good resistance to chemicals



EXAMPLE:

Cutting Costs on Plating Waste Disposal

PROBLEM: Large appliance plant needed an efficient centralized system for disposal of corrosive wastes from several plating lines.

SOLUTION: INDUSTRIAL *engineered system* (see diagram) provides a central basin for neutralization of all the acid, alkali, cyanide and chrome wastes delivered from rinsing operations. Only small amounts of chemicals are added to precipitate the dissolved metals for separation by filtration. The two compact INDUSTRIAL filters extract the solids and discharge a neutral nontoxic effluent to the city sewage system.

RESULTS: EQUIPMENT COSTS REDUCED BY ONE-HALF—two push-button Vertical Leaf Filters *replace* expensive clarifier mechanisms, sludge pumps and vacuum filter! . . . 90% LESS SPACE required for entire system! . . . SIMPLE INSTALLATION—no excavation or complex concrete work! . . . DRY CAKE WASTE DISPOSAL—discharged by mechanical shakers directly from filters into trucks!

INDUSTRIAL FILTER & PUMP MFG. COMPANY
5904 Ogden Avenue, Chicago 50, Illinois

INDUSTRIAL

P-158R

Call or write INDUSTRIAL to find out how an engineered system like this can solve your specific plating waste problems.

PRESSURE FILTERS ◆ ION & HEAT EXCHANGERS ◆ WASTE-TREATING EQUIPMENT

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and abrasion, is a fire retardant.

Basic ingredient in the formulation is du Pont Hypalon (chlorosulfonated polyethylene).

The Hypalon coating is ready for use except for thinning, may be applied by all of the normal methods of application, can be air dried or baked (up to 275 deg. F.).

The manufacturer recommends this paint for use on steel and aluminum, urethane and vinyl foams, many plastics, rubber products, fabrics, concrete, and other types of surfaces.

Manufacturer: Grand Rapids Varnish Corporation, 1350 Steele Ave., S.W., Grand Rapids 2, Mich.

For more data circle **2** on Reader Service Card

★ ★ ★

Heat Exchanger

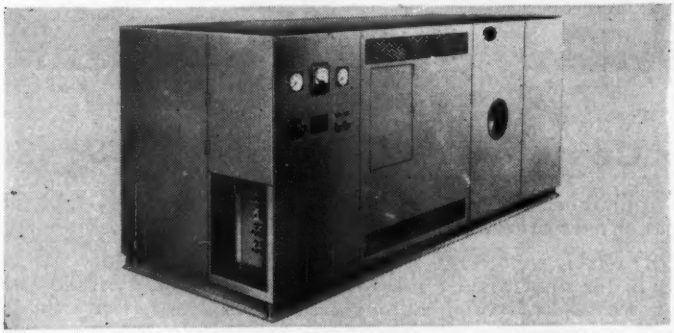
Redesigned "Platecoil" heat transfer units recently introduced by Tranter Manufacturing, Inc., have three "headers" to carry steam or other heating medium to individual passes. Advantages of the recently announced design, according to the manufacturer, include more unform heat distribution, faster heat-up of solutions, faster recovery of temperature after cold work is introduced into the tank.

Better distribution of heating media is attained through use of three headers, which are branches of the main feed li..e, Tranter says. The three headers serve three distribution zones. "Condensate blocking" in one of the zones does not hinder flow of steam

SYNTRON

SELENIUM and SILICON

POWER UNITS



for better, more profitable metal finishing

SYNTRON Selenium or Silicon Rectifier Power Units are designed for all your a-c to d-c power conversion needs. Ideal for electro plating, cleaning, polishing and electro chemical processing.

SYNTRON Selenium or Silicon Rectifier Power Units are engineered to give maximum service with a minimum of cost. The high efficiency, excellent power factor, rugged construction, proven dependability, simplicity of installation and low maintenance make SYNTRON Selenium or Silicon Rectifier Units the most outstanding power conversion unit in their field.

SYNTRON Selenium or Silicon Rectifier Power Units can provide efficient, economical dependable d-c power supplies for your operation.

Write for free illustrated brochure.

SYNTRON COMPANY

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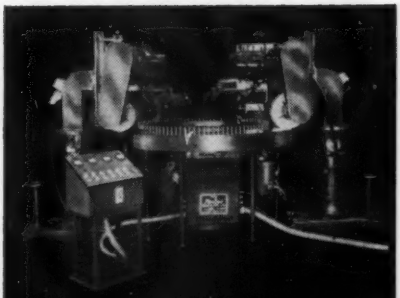
Whatever your finishing requirements may be a PACKER-MATIC is the machine for you. Cost conscious mass producers have recognized the need for high speed, automatic polishing and buffing machines. Let Packer's engineering and developing departments recommend a PACKER-MATIC to meet your demands for faster, more uniform, low cost polishing, buffing and deburring. Send blueprints of parts or samples and we will tell you what PACKER-MATIC can do for you or write for more complete information today.



The finishing touch on cosmetic items is just one of many successful PACKER-MATIC applications.

PACKER-MATIC

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Pioneer Manufacturers of Automatic Polishing and Buffing Machines

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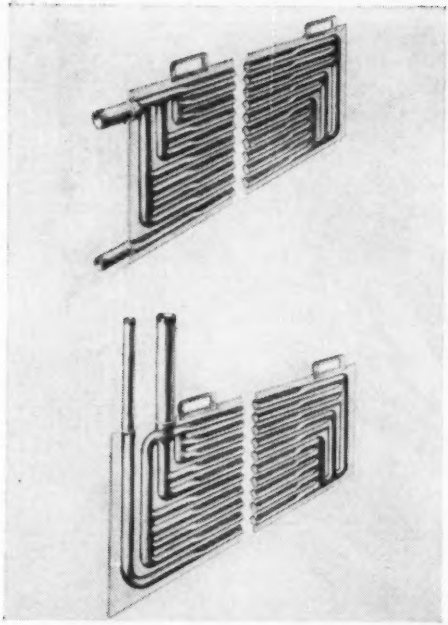


Two Styles of Redesigned Platecoil: headers improve distribution, lower heat-up time

to the other zones, since steam bypasses the other zones on its way to any one of the headers. Condensate is discharged through a single return, which serves the three sets of horizontal passes.

Pressure containment ratings on these models have also been improved. Destruction tests indicate a safety factor of over five to one at 250 p.s.i. steam pressure, the manufacturer states. Higher pressure containment has been achieved through use of new embossing configuration and improved welding and bending techniques.

Manufacturer: Tranter Manufacturing, Inc., Lansing 9, Michigan.

For more data circle **3** on Reader Service Card

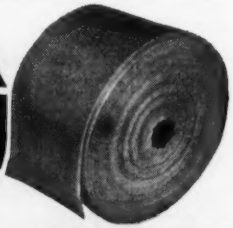
★ ★ ★

Trichlorethylene

Hooker Chemical Corporation has introduced a metal degreasing grade of trichlorethylene which can be used for metal degreasing and for flushing

Bond. TACK CLOTH

PACKED IN ROLLS OR IN BULK
JUST THE WAY YOU WANT IT!



Stays Soft and Tacky — A SPECK-FREE FINISH EVERY TIME — Now available in white or gold — in Four Different Types of Cloth.

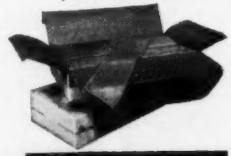
There's a big difference in TACK-CLOTHS—that's why BOND processes four different meshes of cloth with several types of formulations to give you the cloth that best "fits" your special needs. You can get BOND TACK CLOTH packed just the way that suits you best, too—in 150 yard Rolls of 36" wide cloth or in handy Cartons.

No matter which way you buy it, you can be sure that every square inch will stay SOFT and TACKY until the very last bit is used up.

All BOND TACK CLOTH is Spontaneous Combustion Proof, Lint-Free and Wax-Free. Gives a sparkling speck-free finish every time. Clean and Sanitary. No waste. Choice of Standard, Extra Tacky or Less Tacky.

TRY THEM AND COMPARE RESULTS. Samples gladly sent upon request.
A WARRANTY OF SATISFACTION IN EVERY CARTON.

IN ROLLS
Cut off any size piece as needed.



IN BULK
Size is 18" x 36"—folded to 4½" x 18" or 9" x 18" for ease of handling. Cut and folded—ready to use.
Also Individually Packed in Glassine Envelopes —144 to the carton—

Bond® CHEMICAL PRODUCTS CO. 2639 N. CLYBOURN AVE. CHICAGO 14 • ILLINOIS
"The Tacky Wiper Specialist"
For more data circle 356 on Postpaid Card

Switch to SPEE-FLO HOT SPRAY SYSTEMS

Exaggerated? Well, a little, maybe. But the cost of lost materials, time and quality due to runs, sags, and excessive overspray needs no exaggeration to make it an eyesore on any operating budget. Spee-Flo Hot Spray Systems save 25-40% in materials; banish runs, sags and orange peel. Hot spray finishes dry faster, look better, last longer, too. Application techniques are the same as for conventional spray. The equipment is simple and trouble-free, requiring negligible maintenance. If your finishing operation is a bust — either in cost or quality — turn it into a work of art at a savings with Spee-Flo Hot Spray.

Write for free booklet, "Why Hot Spray?"

THE SPEE-FLO COMPANY
6614 HARRISBURG • HOUSTON 11, TEXAS

138

For more data circle 357 on Postpaid Card

of rocket and missile components, which had required another grade.

Flushing of rocket and missile components requires a solvent with a low residue on evaporation and also non-impact sensitivity in the presence of liquid oxygen. This trichlorethylene has a residue on evaporation of 0.0005 per cent maximum, also meets all of the impact sensitivity requirements.

Technical Data Sheet 814, which gives complete specifications and other information on the product, is available from the manufacturer.

Manufacturer: Hooker Chemical Corporation, Niagara Falls, N. Y.

For more data circle 4 on Reader Service Card

★ ★ ★

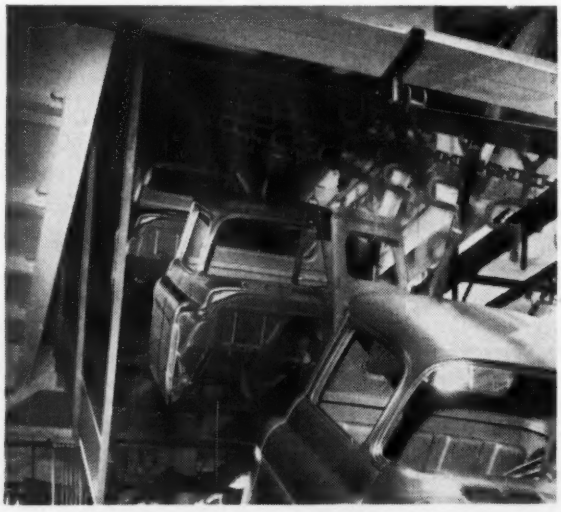
Masking Tape Dispenser

The Brady Tapematic dispenses pre-cut labels, masks or special die-cut shapes made of any pressure-sensitive tape: paper, cloth, foil, film, double-coated paper.

This device delivers the tapes on a conveyor to the operator's finger tips—at the operator's own rate of speed. More than one operator may use the same machine on a production line. The Brady Tapematic may be operated by a foot switch for intermittent application or by a micro-switch for continuous application.

The pre-cut tapes are dispensed from a roll of slit Brady Blue Streak Release Liner. The "V-Groove" principle of the Tapematic slits the liner and deposits the tape on the conveyor.

BAKING



TRUCKS AND CARS

9 new Despatch Ovens bake finishes on popular low-priced line

One of America's major automobile manufacturers has just installed 9 huge new Despatch finish-bake ovens at one of its division plants. Eight ovens are located on the roof of the plant; one inside. Temperature tolerances are controlled to ±5° F. Two prime ovens have catalytic combustion units that burn solvents released from painted parts. Here is another example of Despatch's leadership in heat processing. For information on *any* type of installation, write or call:

DESPATCH OVEN COMPANY
619 S. E. 8th St., Minneapolis 14, Minn., Dept. 53C

DESPATCH

DESPATCH

For more data circle 358 on Postpaid Card

ONLY KENVERT®
ASSURES TROUBLE FREE RESULTS
ON CADMIUM

After months of research, KENVERT has finally developed a compatible brightener and bright dip to assure uniform results on cadmium plate. The brightener—KENVERT NO. 25-LM—available in liquid form, is easily diluted and easy to use. It gives uniform reproducible results with any of the KENVERT powder chromating treatments; whether clear bright, iridescent, or olive drab. You will have maximum protection with substantial savings.

KENVERT NO. 25-LM ADVANTAGES

- Perfect Chromating Results
- Uniform Brightness
- Good Solderability
- Ductile Deposits
- Excellent Throwing Power
- Easily Diluted
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- Easy to Maintain

Use with these KENVERT Powders

KENVERT NO. 27
Clear, White, Bright
KENVERT NO. 18-M
Iridescent, Hard Wet Film Strength
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Phone: TRemont 5-3357

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Toronto, Canada

Distributors in major industrial
United States cities

For more data circle 359 on Postpaid Card

Brady Tapematic Masking Tape Dispenser

Different sizes and shapes of printed or unprinted labels may be dispensed from the same roll.

The Brady Tapematic is designed for speeding production-line masking, labeling, packaging, or special-purpose tapes — electrical insulation, double-coated mounting tapes, and so on.

Manufacturer: W. H. Brady Co., 746 West Glendale Ave., Milwaukee 9, Wisconsin.

For more data circle 5 on Reader Service Card

★ ★ ★

Wrinkle-Free Phenolic Coatings

A cold-mix technique for the production of wrinkle-resistant varnishes has been announced by Union Carbide Plastics Company, Division of Union Carbide Corporation.

This technique, coupled with new combinations of driers, results in phenolic varnishes with unusually high resin-solids content which may be ap-

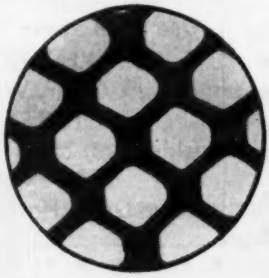
PROTECT FINE PLATED SURFACES

with **RP** *Neotex*®

PROTECTIVE MESH

Neotex . . . the open pattern Neoprene rubber matting, protects highly polished finishes when used to line any surface where goods are worked on or in transit. In roll form, Neotex can be easily cut to any size or shape . . . it's rugged and long lasting, resistant to abrasives, caustics, heat, acids, oils, oxidation. Open pattern permits buffing compounds to settle. Available in a fine or coarse pattern. Write for complete information.

RP *Neotex*®



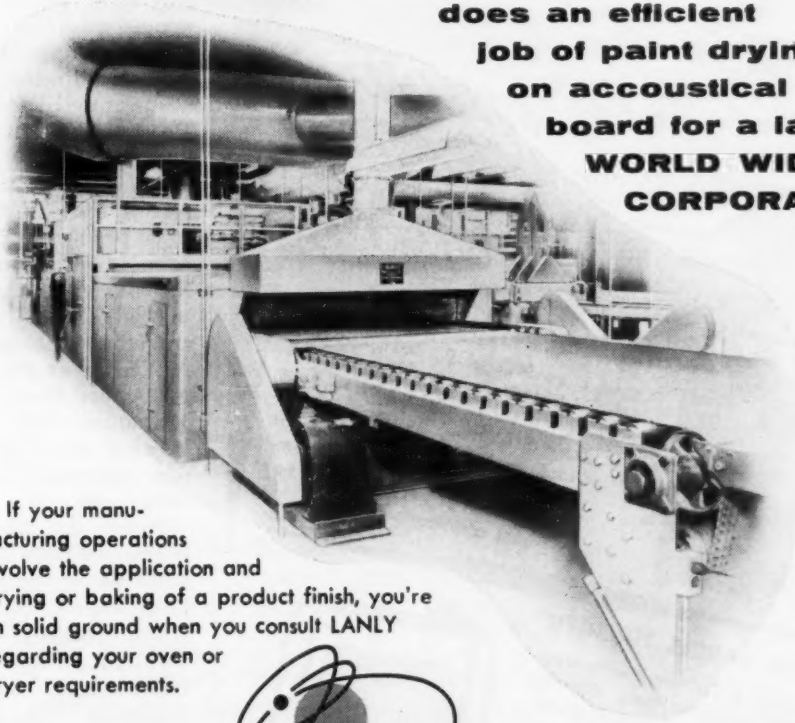
RESEARCH PRODUCTS CORPORATION

Dept. 76, Madison 1, Wis.

For more data circle 360 on Postpaid Card

This lanly Conveyorized Lay-Down-Dryer

does an efficient job of paint drying on accoustical board for a large WORLD WIDE CORPORATION



If your manufacturing operations involve the application and drying or baking of a product finish, you're on solid ground when you consult LANLY regarding your oven or dryer requirements.

Find Your Representative In The Yellow Pages

THE lanly CO.

FINISHING OVENS

2800 Euclid Avenue • Cleveland 15, Ohio

LANLY welcomes a discussion of your drying and baking operation problems. Write for Catalog No. 560 and get better acquainted with our organization.

Atlanta, Georgia • Birmingham, Ala. • Boston, Mass. • Chicago, Ill. • Cleveland, Ohio
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Pittsburgh, Pa. • Rochester, N. Y. • San Francisco, Calif. • St. Louis, Mo.

For more data circle 361 on Postpaid Card

plied at least at normal thickness without fear of wrinkling, Union Carbide says.

These features make possible thicker coatings in a single application.

Laboratory work is being conducted on a metal primer and a freight car paint based on these varnishes. When perfected, these finishes can be applied in dry films of four or five mil thickness.

Developer: Union Carbide Plastics Co., Div. of Union Carbide Corp., New York, N. Y.

For more data circle **6** on Reader Service Card

★ ★ ★

Paint Heater

A paint heater with a direct-type heater element has been announced by Binks Manufacturing Co.

The unit's paint tract is built around long slots or passageways equally spaced around the outside diameter of a cylindrical aluminum block. Passageways are arranged so that all the paint entering the heater must pass through each of them before leaving the heater. The paint travels a distance of 27 linear feet, over more than 3-1/3 square feet of heating area, before entering the spray gun.

Since the heat is emitted radially from the center of the block outward, it must pass through the paint before it is dissipated. Heat transfer is accomplished with a surface block temperature only a few degrees higher than the desired paint temperature, the manufacturer states.

H. W. Kramer
YOUR KEY TO BETTER FINISHING...
BUFFING LATHE
1 to 7½ H.P. Ball Bearing V-Belt Drive. Pre-determined speed set at factory or to your specifications. Buffing wheels and compounds available for every industry . . . Special compounds recommended for Special applications.
SINGLE BARREL TUMBLER
Size: 30" x 36" or engineered to your specifications. Barrels lined with kiln-dried and glued maple. Child's play to operate. Economical on space as motors are individually mounted overhead—double decked or single. Tumbling supplies available also.
Write Dept. GF for Detailed Information
H. W. KRAMER CO.
120-30 JAMAICA AVENUE
RICHMOND HILL 18, N. Y.

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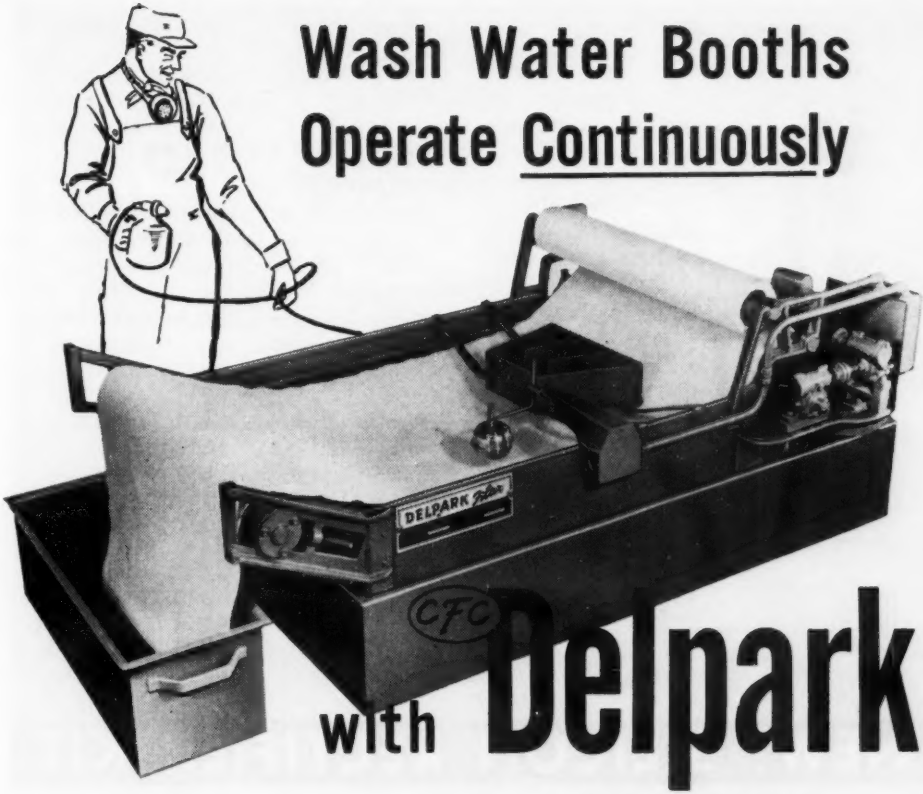


Wash Water Booths Operate Continuously

with Delpark FILTERS

There are no costly shut-downs for cleaning when you use CFC Delpark Paint Spray Booth Filters. Paint overspray is automatically removed from the wash water by periodic filtration cycles. Deactivated paint particles are stopped from recirculating. They can't foul the jets or cause undue pump wear.

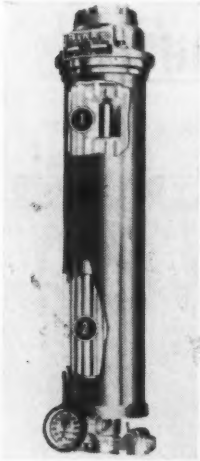
CFC Delpark Filters are continuous and self-cleaning. They operate on the gravity principle, discharging paint in a relatively dry state to an outside container. Valuable pigments are easily reclaimed.

Write for technical literature to Dep't PF

COMMERCIAL FILTERS CORPORATION
MELROSE 76, MASSACHUSETTS
PLANTS IN MELROSE, MASSACHUSETTS AND LEBANON, INDIANA

MICRO-CLARITY AT MINIMUM COST

For more data circle 363 on Postpaid Card



Paint Heater

The paint tract is easily removed for cleaning. Removal of the outside tube allows the entire tract to be withdrawn.

The paint heater is available for either circulating or non-circulating paint systems, and for 115- or 230-volt operation. Either model features a 1500-watt heating element and each has a capacity of 30 ounces per minute delivery at a maximum temperature of 160 deg. F.

Manufacturer: Binks Manufacturing Company, 3118-40 W. Carroll Ave., Chicago 12, Ill.

For more data circle **7** on Reader Service Card

★ ★ ★

Aluminum Drawing Compound

An aluminum drawing compound, DC-327, under the trade name of "Luma-Draw" prevents sticking or binding of blanks in the draw dies, protects finish applied before forming, prevents galling of steel dies, and protects hard rubber dies against abrasion.

Manufacturer: Schaffner Manufacturing Co., Inc., Schaffner Center, Emsworth, Pittsburgh 2, Pa.

For more data circle **8** on Reader Service Card

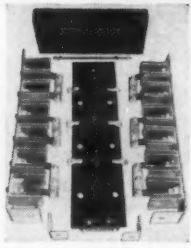
★ ★ ★

Dry Fluoride Compound

A dry fluoride-containing compound recently introduced by Platers Research Corporation is useful in acid

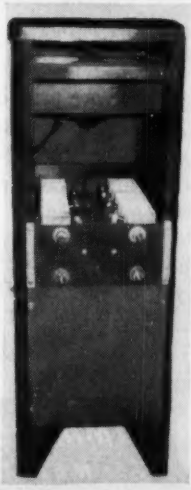
To page 104→

NEW! SILICON RECTIFIER KIT



Here's a low-cost conversion unit with hermetically-sealed, non-aging cells that:

- increases efficiency
- eliminates replacement and maintenance problems
- cuts current consumption
- is easy to install



This modern "package" unit will pay for itself in a short time. Initial cost is lower than the conventional replacement rectifiers you have been using.

DRESSER Silicon Rectifier Kits are available from stock for the majority of popular transformer models and can be installed quickly and easily.

Write today for complete information and prices. Start saving tomorrow!

DRESSER Silicon Rectifier Kit installed . . . in standard model rectoplater. →

Dresser Electric Co.

2705 WIGHT STREET
DETROIT 7, MICHIGAN

For more data circle 364 on Postpaid Card

IBM improves its paint finishing using sprayed textured vinyl

Unichrome Coating 6400, a new, spray applied, textured vinyl finish, has greatly improved the quality of machine covers for IBM's Data Processing equipment. It provides much longer life in service due to its increased scratch and mar resistance. Rejects from in-transit damage and material handling have been sharply reduced. Savings, particularly in refinishing, have been accomplished by these improved physical properties.

Available in a variety of colors, Unichrome Coating 6400 delivers a handsome leather-like finish with less complications and cost than obtained by use of laminated vinyl.

Films range from 8 to 20 mils in thickness and will outwear ordinary textured enamels by 10 to 1. Send for bulletin. Write Metal & Thermit Corp., Rahway, N. J.

METAL & THERMIT
CORPORATION

For more data circle 365 on Postpaid Card

NEW FROM "3M"

A super-speed abrasive that licks all three barrel finishing problems!

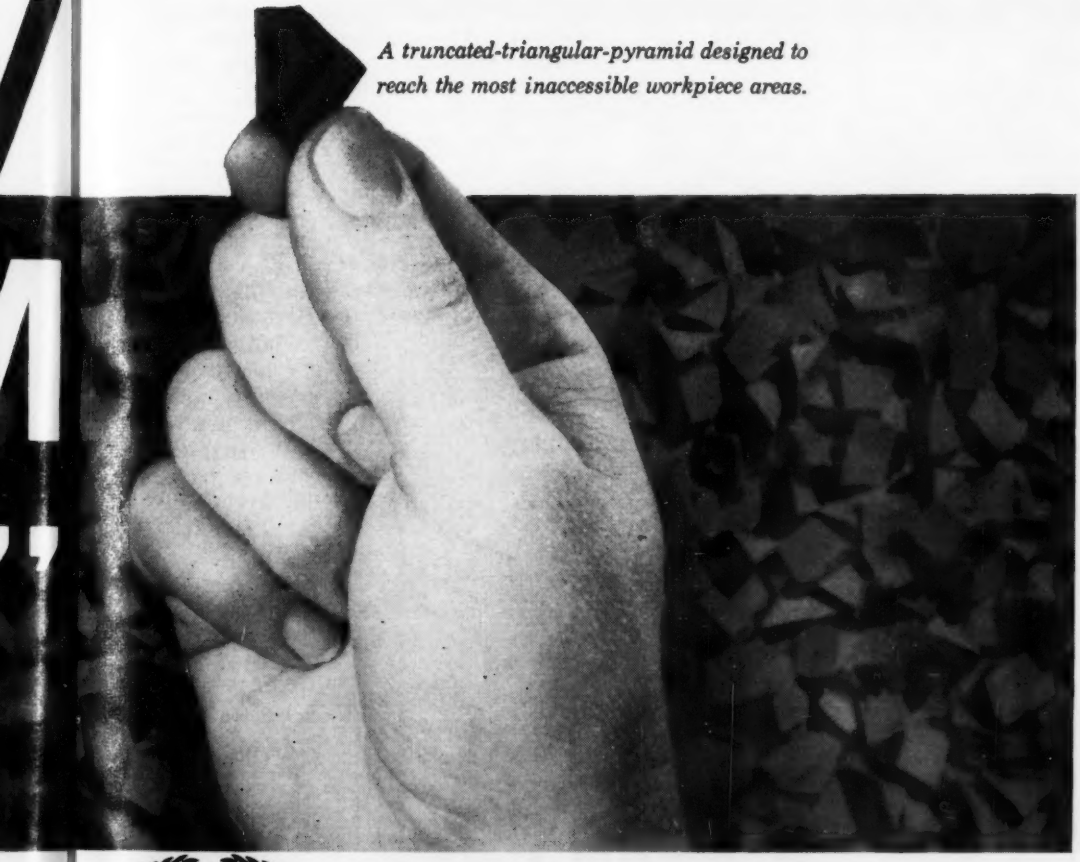
1. **DISCOLORATION** You get the world's *cleanest* workpiece surfaces with HONITE "C-R" Tumbling Shape. Its unique binder resists wetting as it wears away—won't attract or unite with dirt; doesn't cling to the workpiece.

2. **IMPINGEMENT** HONITE "C-R" Tumbling Shape will not nick or impinge surfaces or edges of work. It's *super-light* to produce superior micro-inch surface finishes, smooths off edges and radii in record time. Burrs are cut off before they can be peened over!

3. **FRACTURING** New HONITE Brand "C-R" Tumbling Shape *will not* fracture or fragment in the barrel. This virtually eliminates the annoying problem of lodging of media particles in pockets or threads of workpieces.

All this plus a cutting speed unsurpassed by any abrasive chip on the market today!

A truncated-triangular-pyramid designed to reach the most inaccessible workpiece areas.



Honite

"C-R" TUMBLING SHAPE

GET THE COMPLETE STORY:

Find out yourself how, for the first time, you can now get these characteristics combined to such a high degree in one tumbling medium. Use this coupon.

MINNESOTA MINING AND MANUFACTURING COMPANY

3M COMPANY

. . . WHERE RESEARCH IS THE KEY TO TOMORROW

"HONITE" is a registered trademark of 3M Co., St. Paul 6, Minn. Export: 99 Park Ave., New York 16, N.Y. Canada: London, Ontario.

Minnesota Mining & Manufacturing Company
Dept. FI-29, 900 Bush Avenue, St. Paul 6, Minnesota

Send me free copy of Technical Booklet, "HONITE" Brand C-R Tumbling Shape.

Name_____

Position_____

Company_____

Address_____

City_____ Zone____ State____

For more data circle 366 on Postpaid Card

treatment of metals, can be used with less hazard to personnel than liquid hydrofluoric acid, the manufacturer states.

Fluromine, as the product is called, is recommended for use in water solution as an acid pickle, for smut removal, activating and bright etching of aluminum, and for accelerating the rate of pickling of stainless steels and titanium. The product also aids in pickling colloidal silicate films and pickling of sand castings.

Manufacturer: Platers Research Corporation, 59 E. 4th St., New York 3, New York.

For more data circle **9** on Reader Service Card

★ ★ ★

Plating Cylinder

Description: A plating cylinder recently introduced by G. S. Equipment Co. is built of interchangeable components that can be replaced quickly with stock parts. It will carry loads up to 275 pounds and operate at temperatures up to 220 deg. F.

Specifications: Trussed-rib, all bolted construction; bussed for 1420 amperes, through cycle; all parts available in three types of plastic from stock, and all are interchangeable; any part can be replaced using only a ½-inch wrench. Cylinders available in models to fit all belt or gear drives; all makes, types, sizes.

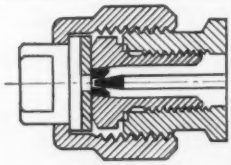
Applications: Recommended by the manufacturer for use in acids, alkalies, electrolytic alkaline de-

To page 109→

with
TUNGSTEN CARBIDE valve seat and needle
•
STAINLESS STEEL body and cap
•
TEFLON packings

for efficient, trouble-free performance

Here's the gun designed in detail for better, trouble-free performance. Needle cleans seat orifice automatically. For use at pressures from 400 to 2,000 psi. Complete choice of interchangeable orifice tips in all spray patterns, capacities and materials.

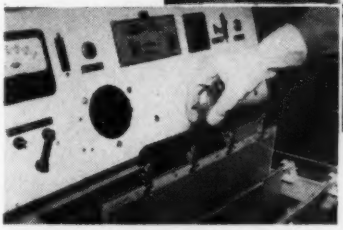


SPRAYING SYSTEMS CO.
3229 Randolph Street • Bellwood, Illinois

FOR INFORMATION WRITE FOR BULLETIN 95

For more data circle 367 on Postpaid Card

Two of the four Sel-Rex Jet Platers —complete electroplating facilities in 34" x 28" x 33" cabinets. This equipment is used as a step in the process of producing some of the printed wiring boards for the SAGE computer, and for experimental equipment currently under development.



IBM Plating operator removes printed wiring board from Sel-Rex Jet Plater where it has been plated with Sel-Rex Bright Gold. The Jet Platers assure optimum conditions for the electrodeposition of Sel-Rex Bright Gold for this exacting application.

Heart of the SAGE System is the 275 ton IBM computer, one of the world's largest and most reliable. Shown here are some of the computer frames containing pluggable electronic units that perform the data processing involved in solving air defense problems.

SEL-REX BRIGHT GOLD AND 4 JET PLATERS HELP PROVIDE "BUILT-IN" RELIABILITY TO IBM SAGE COMPUTER

When it comes to protecting our country from possible surprise air-attack, only the best, most reliable instruments and equipment will do. Understandably, IBM was chosen to build the 275 ton computer pictured in part at the lower left, which is the heart of our SAGE System. The SAGE computer performs millions of computations at lightning speed, and continuously checks them—*automatically.*

Approximately 7,300 pluggable units containing printed card assemblies are used in this computer. Needless to state, the proper functioning of these units is essential. Sel-Rex Bright Gold, in four Jet Platers, is used in the manufacture of the IBM SAGE computer, and other military equipment under development. Built-in reliability—for which IBM equipment is famous the world over—assures us all of constant electronic watchfulness 24 hours a day.

Sel-Rex can offer built-in reliability to your product through the unique metallurgical properties of a precious metal—or by designing plating or metal finishing equipment to your specific requirements...from a single piece of equipment to a complete facility. Our latest catalog—#CHP—gives details.

Sel-Rex® SEL-REX CORPORATION

NUTLEY 10, NEW JERSEY

Manufacturers of Exclusive Precious Metals Processes, Metallic Power Rectifiers, Airborne Power Equipment, Liquid Clarification Filters, Metal Finishing Equipment and Supplies

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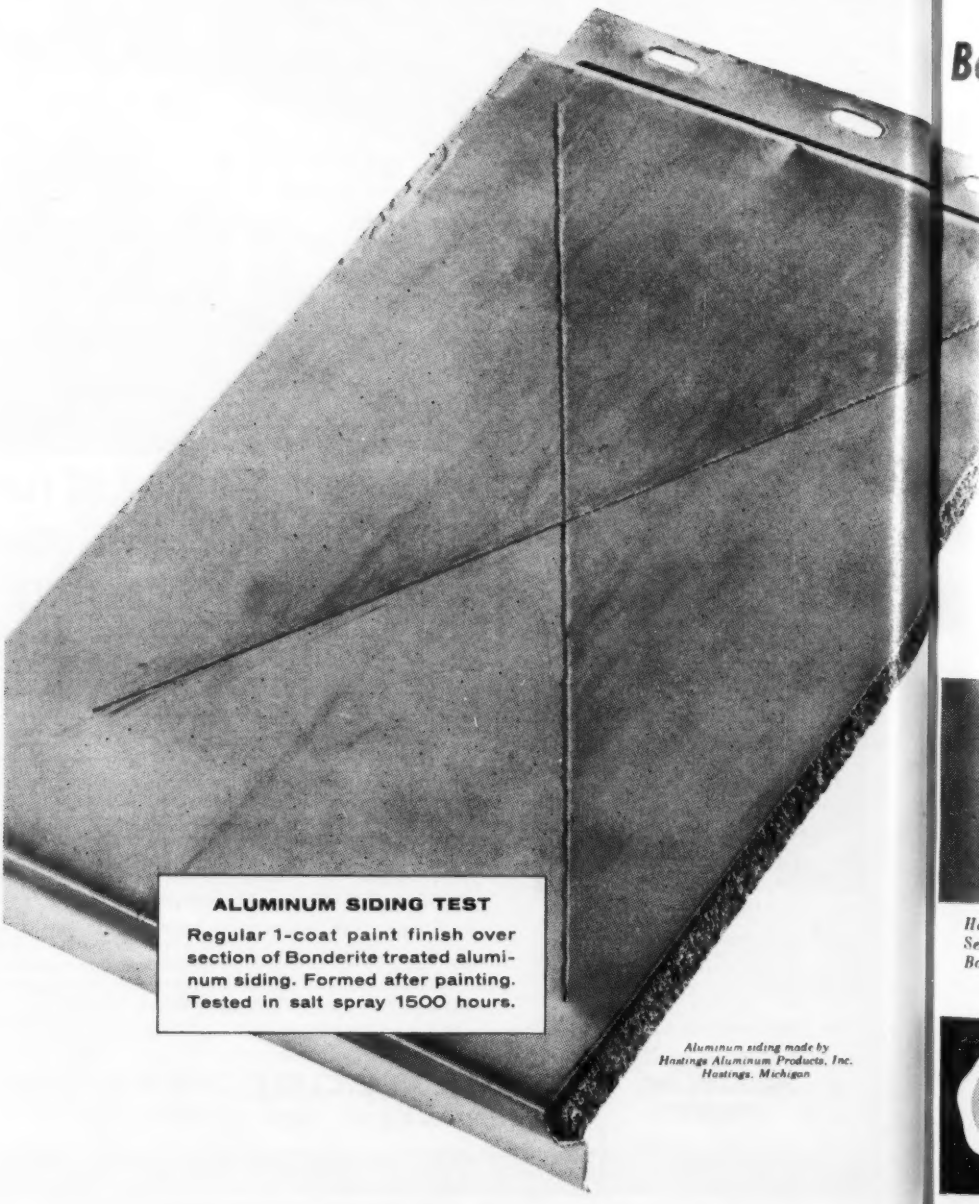
BONDERITE



ALUMINUM SIDING TEST

Regular 1-coat paint finish over section of Bonderite treated aluminum siding. Formed after painting. Tested in salt spray 1500 hours.

Aluminum siding made by Hastings Aluminum Products, Inc. Hastings, Michigan

E for ALUMINUM

Better paint adhesion...better corrosion control

In two hundred plants—many of them the leaders in their particular fields of aluminum fabrication—Bonderite for aluminum is being used today!

Bonderite makes it possible to take aluminum in the coil, run it through a continuous line in which the strip is cleaned, Bonderized, roll-coat painted, dried—and then recoiled.

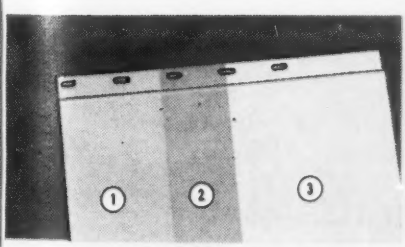
Because Bonderite gives paint such a secure foothold, it will stand severe forming operations (see photo below). With the Bonderite corrosion barrier at work, durability of the paint finish is almost indefinitely prolonged.

Bonderite meets and exceeds the requirements of Government Specification MIL-C-5541. Bare corrosion resistance is outstanding.

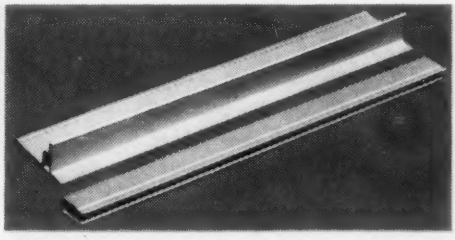
There's more than one type of Bonderite for aluminum. Besides the paint base, there's a Bonderite that creates a pleasant green coating, for use on architectural products. There's a Bonderite which protects without changing the characteristic color of the aluminum. Another Bonderite coats aluminum, steel and zinc—just the thing for mixed production.

There is a Bonderite, in fact, for every form of aluminum production, and for practically every alloy.

The big news in surface treatment for aluminum today is Bonderite! Let a Parker man tell you all about it!



Here's the 1-2-3 for durability of painted aluminum. Section of siding shows bare aluminum, (1); Bonderite treated, (2); and roll-coated paint, (3).



These aluminum window and screen frame sections were Bonderized and painted in the strip and formed after painting. There isn't a break in the finish anywhere!

Since 1914—leader in the field

PARKER RUST PROOF COMPANY
2172 E. Milwaukee, Detroit 11, Michigan
Tel: TRinity 5-3377

BONDERITE corrosion resistant paint base	BONDERITE and BONDERLUBE aids in cold forming of metals	PARCO COMPOUND rust resistant	PARCO LUBRITE wear resistant for friction surfaces	TROPICAL heavy duty maintenance paints since 1883

*Bonderite, Bonderlube, Parco, Parco Lubrite—Reg. U.S. Pat. Off.

For more data circle 369 on Postpaid Card

GET *ALL* THE ANSWERS
TO *YOUR* FINISHING PROBLEMS

at the
FIFTH INDUSTRIAL FINISHING EXPOSITION!

(Held in conjunction with the
GOLDEN JUBILEE CONVENTION
of the
AMERICAN ELECTROPLATERS' SOCIETY)

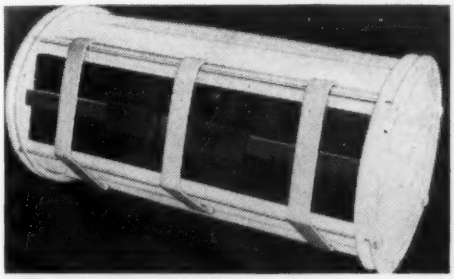
The finishing experts will all be under one roof next June. In Detroit, at the Detroit Artillery Armory, from June 15 to 19, at the Fifth Industrial Finishing Exposition!

Take your problems to them. Get expert help . . . at the largest display of finishing equipment, materials and processes ever assembled under one roof.

Make a list of your plating problems. Take it to Detroit with you. See the men who man the booths. The experts with professional, up-to-date help for you. They'll be there to demonstrate the right way to solve your problems.

If you want more information on the Fifth Industrial Finishing Exposition *now*, ask the exposition chairman: • • • • • • • • • • •

HOWARD J. McALEER
3171 BELLEVUE AVE.
DETROIT 7, MICHIGAN



G-S Trussed-Rib Plating Cylinder: heavier loads, higher temps, interchangeable parts

scaling; plating solutions, other surface treatments.

Manufacturer: G. S. Equipment Co., 15585 Brookpark Rd., Cleveland, Ohio.
For more data circle **10** on Reader Service Card

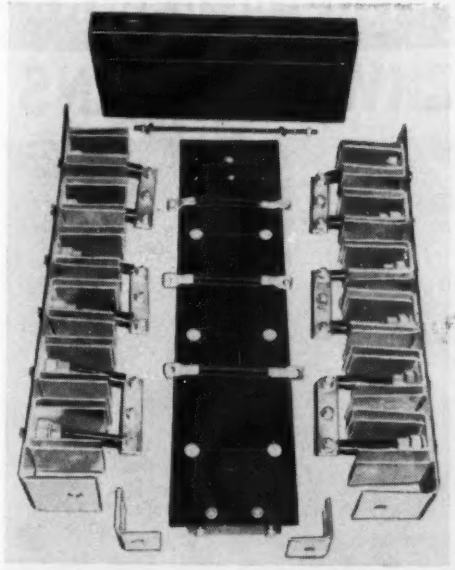
★ ★ ★

Rectifier Conversion Kit

A kit for converting magnesium-copper sulfide and selenium rectifiers to silicon has been introduced by Dresser Electric Co.

The kit includes all parts needed to replace existing rectifier stacks with silicon, said to be a more efficient and more durable semiconductor material.

Manufacturer: Dresser Electric Co., 2705 Wight St., Detroit 7, Mich.
For more data circle **11** on Reader Service Card

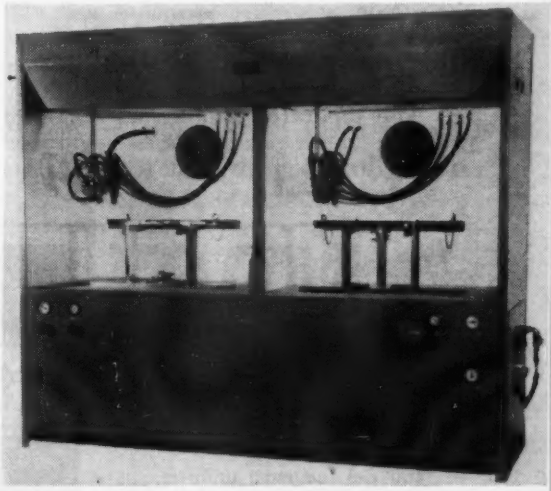


Kit Converts Old Rectifiers to Silicon

★ ★ ★

Dual-Station Spray Decorating Machine

An automatic spray decorating machine with two spraying stations is useful for high-volume spray painting of oval-shaped or rectangular pieces where fine mask definition and paint demarcation are required.



Conforming Matrix Dual-Station Spray Decorator: higher production, multiple colors

Since the machine has two stations, one station can be loaded and unloaded while the other station has work in process. The two stations can also be used for spraying two different colors, or for painting different areas of the same part.

The machine is self-contained,

comes ready to operate, needs only air lines and an exhaust stack.

Manufacturer: Conforming Matrix Corporation, 356 Toledo Factories Bldg., Toledo 2, Ohio.

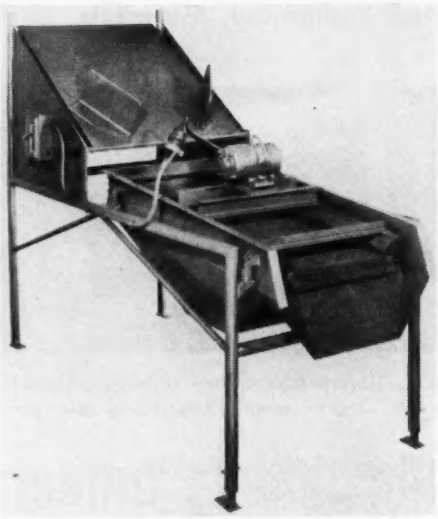
For more data circle 12 on Reader Service Card

★ ★ ★

Parts-Media Separator

A media separator with a vibrating unit that imparts high-frequency, low-amplitude vibrations to the screening mechanism is said to separate parts and media more quickly. A bed with a screening surface 18 inches wide and 48 inches long effectively separates a wide range of parts and media sizes and shapes, the manufacturer states.

The separator handles all standard screen mesh sizes, comes equipped with three screens that will do most standard separations.



Roto-Finish Vibrating Media Separator

The vibrating unit is completely shock mounted to dampen vibrations

To page 114→

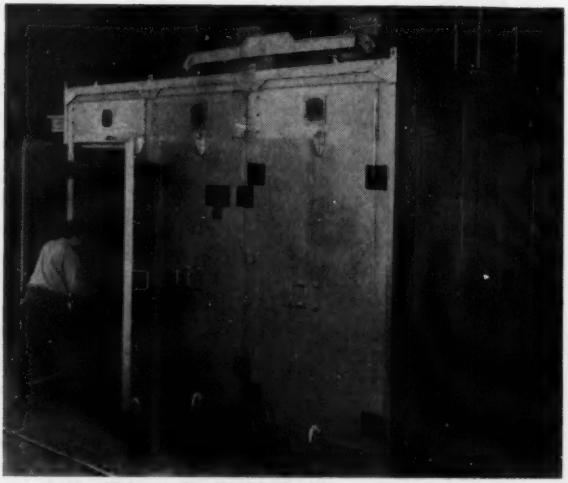
for the MOST in DRYING or BAKING

ROCKWELL OVENS

You get the most uniform, economical, recirculation heating in Rockwell Ovens. Thousands of them the world over prove their excellent performance.

Made in standard cabinet, rack or truck type, single or multiple compartment—gas, electric or steam heated. Also special batch loading or conveyor types. Write for Catalogs.

W. S. ROCKWELL CO.
2909 Eliot Street
Fairfield, Conn.



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"NO MORE REJECTS FROM PAINT CHIPPING SINCE WE STARTED USING

DuBOIS DURA-KOTE"

—WILLIAM P. SMITH
GENERAL FOREMAN
SHAMPAINE COMPANY
ST. LOUIS, MO.

After testing or using 12 different phosphatizers, the Shampaine Co., manufacturers of nationally distributed physicians' and hospital equipment, has agreed, DuBois' Dura-Kote gives almost perfect results.

Dura-Kote has withstood all exacting requirements for superior salt spray, humidity and coating weight tests.

It's easily controlled, is non-sludging and cleans better. Works for a long period in the tanks. On the job it gives the maximum in paint adherence.

DuBois can help solve your phosphatizing problems. Write today, Dept. AG, The DuBois Co., Inc., Cincinnati 3, Ohio for free Handy Daily Control booklet used in phosphatizing operations.

THE DuBOIS CO., INC. 1120 W. Front Street Cincinnati 3, Ohio

Other Plants: Los Angeles · Dallas · E. Rutherford, N. J.

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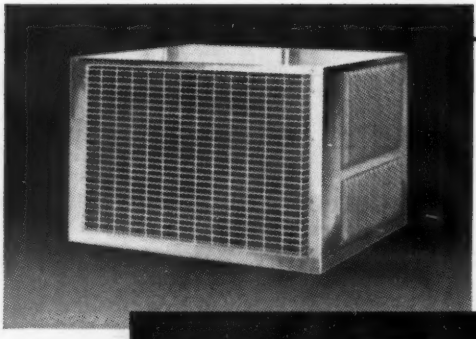
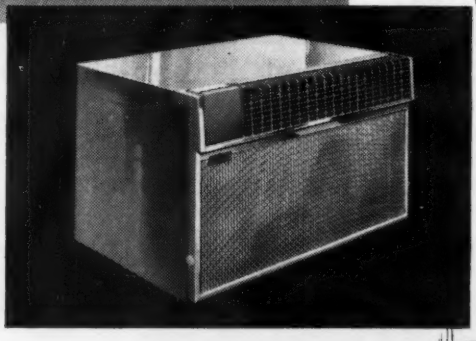
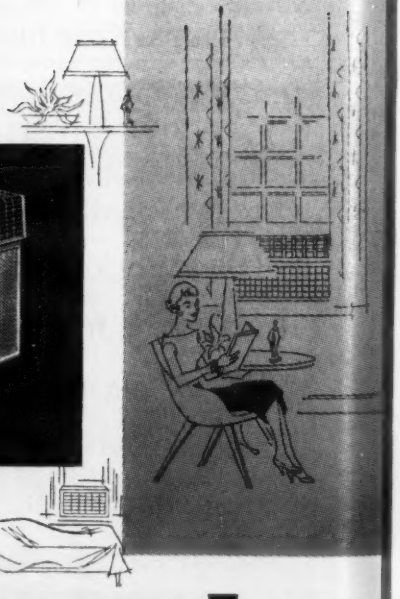
Amazing new one-coat finish or

DURAC





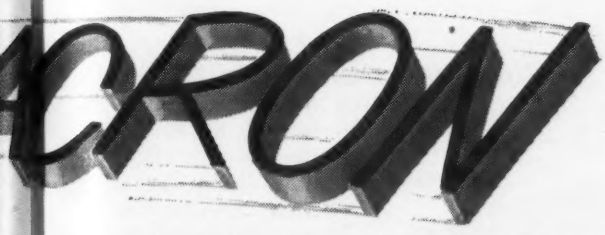


PITTSBURGH INDUSTRIAL FINISHE

PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTI

IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED

sh or Air Conditioners



THERMO-SETTING ACRYLIC ENAMEL

Gives you substantial cost savings . . . with no sacrifice in quality

Exceptional adhesion and resistance to corrosion and weather-wear, combined with easy-working properties, make DURACRON the perfect one-coat finish for air conditioners.

This amazing new acrylic enamel effects *substantial cost savings*—assures color-holding and exterior durability that *can be duplicated only by multiple coats of high-quality conventional baking enamel.*

DURACRON can be applied by a variety of high-speed methods —even on difficult-to-finish parts. Because of inherent hardness and flexibility, it withstands wear and tear of factory assembly and shipment. It provides unusual protection against many in-service hazards. High resistance to corrosive industrial and chemical fumes and salt air assures longer life and better service.

Extensive laboratory and field tests, as well as widespread use by leading manufacturers, have demonstrated convincingly DURACRON'S superior performance and cost savings.

Mail This Coupon Today ——→

• Write for free brochure containing detailed information about amazing new DURACRON. Explains what it is and how you can use it to have a better finish and reduce production costs.

Pittsburgh Plate Glass Company, Industrial Finishes Division, 1 Gateway Center, Pittsburgh, Pa.

Gentlemen: Please send me copy of your free booklet on new DURACRON Acrylic Enamel.

Name_____

Address_____

City_____ County_____ State_____

Name of Company_____

For more data circle 373 on Postpaid Card

in the separator, requires no holding bolts.

Manufacturer: Roto-Finish Co., 3704 Milham Rd., Kalamazoo, Mich.
For more data circle **13** on Reader Service Card

★ ★ ★

Powdered Chromate

A powdered chromate known as Duracoat M-2-P produces blue-bright, stain-resistant finishes on zinc plate.

One-half ounce of Duracoat M-2-P plus a small amount of nitric acid is required to make up one gallon of solution. No leaching is required.

Manufacturer: Heatbath Corp., Springfield 1, Mass.
For more data circle **14** on Reader Service Card

★ ★ ★

Aluminum Paint Additive

An additive that eliminates deleafing of aluminum pigments in alkyd and high-acid varnish vehicles has been perfected by Alcoa Research Laboratories.

Use of such paints has been hindered because aluminum's sought-after leafing action was destroyed by high-acid vehicles. The paints had to be job mixed. Long storage life was impossible.

To be called Alcoa Stabilizer Number 5, the additive makes possible ready-mixed formulations with acid values up to 28. A wider range of high - acid - number aluminum paints now will become available, with long storage life assured.

Other advantages afforded by Alcoa Stabilizer Number 5 include increase in the

leading auto manufacturers
install clepco
QUARTZ
OVENS
Here's Why...
CLEPCO Quartz Paint Ovens are based on the use of special CLEPCO Quartz Heaters designed to emit that part of the heat spectrum most readily absorbed by paints.
Another major auto manufacturer reports that CLEPCO Paint Ovens are lower in original cost as well as in operating costs than the conventional gas fired convection ovens previously in use.
CLEPCO'S Complete Research Facilities are at your service to determine the most efficient quartz oven for your requirements.
SEND FOR COMPLETE INFORMATION
THE CLEVELAND PROCESS COMPANY
1965 EAST 57TH STREET • CLEVELAND 3, OHIO
CLEPCO
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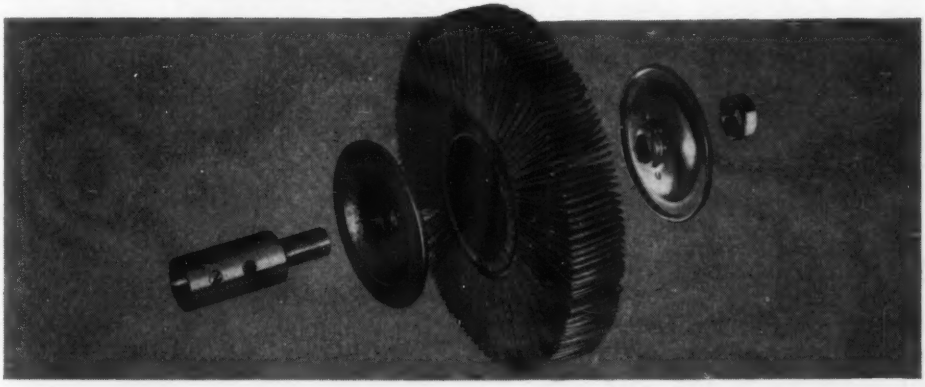
GRIND-O-FLEX

"the FLEXIBLE coated abrasive wheel"



fine grits for
POLISHING • BUFFING
SATIN FINISHING

coarse grits for
DEBURRING • SMOOTHING FLASH
CLEANING & CHAMFERING

★ Sizes from 2" to 16" Diameters. ★ Sets up immediately on any light spindle or heavy duty polishing jack. ★ Smaller Sizes are just right for portable use. ★ Absolute uniformity of finish for entire wheel life. ★ Requires no skill or experience to produce a perfect finish.

★ May be mounted in tandem for finishing sheets up to 60" wide.

For various grits and sizes available see your distributor, or write —

merit Products, Inc.

3691 LENAWEE AVE., LOS ANGELES 16, CALIFORNIA

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durability of the paint, and doubling of corrosion resistance against salt water and salt spray, Alcoa says.

Only a few ounces of additive per gallon of aluminum paint are needed to achieve these results.

Manufacturer: Paint Finishes Division, Alcoa Research Laboratories, New Kensington, Pa.

For more data circle 15 on Reader Service Card

★ ★ ★

Belt-Conveyor Components

Belt-conveyor components which can be quickly assembled to make custom belt conveyors for specific jobs are announced by The Alvey-Ferguson Company. Designated "E-Z-Bild," the belt conveyor components require no special training to assemble. Unskilled personnel can erect level, inclining or declining roller-bed belt conveyors of

Alvey-Ferguson Belt-Conveyor Components

To page 120→

FICTION and FACT

FICTION: R P Paint Arrestor Equipped Booths Cost More than other Methods of Paint Overspray Removal.

FACT: Comparisons Show R P Paint Arrestor Booths' Operating Cost 30-50% Less than Water Wash Booths of Equal Size.

RP® PAINT ARRESTORS

Photo Courtesy American-Standard, Elyria, Ohio Plant

R P Paint Arrestors save money in other ways, too. Maintenance is simple—labor costs average 40 to 85% less than for equivalent water wash booths. Down-time is reduced considerably, production is increased, less floor space required. And, with all the savings, R P Paint Arrestors are more efficient—and adaptable to almost every type operation Write for more information.

RESEARCH PRODUCTS *Corporation*

Dept. 38, Madison 10, Wis.

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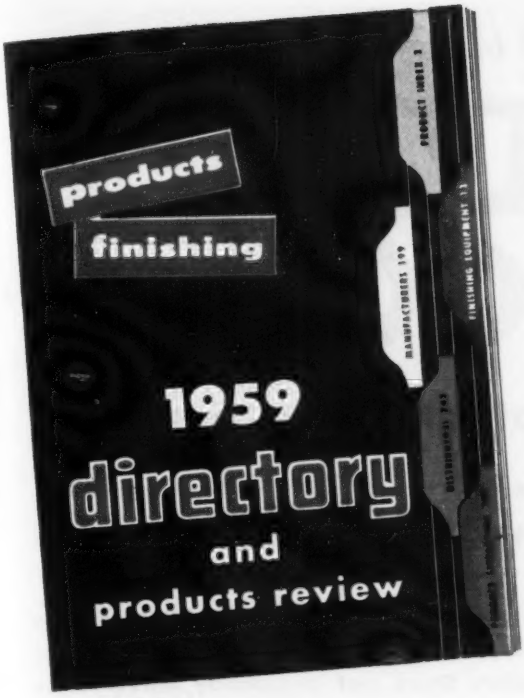


YOUR EVER-PRESENT SALESMAN

Sitting next to every one of your prospects, every day, is an impossible task. Next best thing to a live salesman is the "live" influence of the Products Finishing DIRECTORY to help prospects select your products and services.

21,000 CIRCULATION GUARANTEED

LARGEST CIRCULATION IN THE FINISHING FIELD

at the LOWEST COST PER THOUSAND $10.07

Space used in the 1959 DIRECTORY earns an attractive rate when combined with space in PRODUCTS FINISHING . . . together the "hottest sales team in the finishes-on-metal industry".

WRITE FOR NEW, DETAILED NIAA MEDIA FORM

Closing Date February 15, 1959 . . . Order Space Now!

PRODUCTS FINISHING DIRECTORY

431 MAIN STREET • CINCINNATI 2, OHIO

Introducing Allied's

IRILAC™ #1000

New, Clear Protective Coating for All Metals . . . As Safe and Easy to Handle as Water!

New Method of protection incorporates corrosion inhibitors in a water-soluble polymer base. Dries to an extremely thin, tough, durable coating—clear in color. Does not chemically affect base metal or any post treatments. Used as a protective treatment alone or to enhance value of post treatments.

Allied's new Irilac #1000 is a concentrated solution of a water-soluble polymer with built-in complex corrosion inhibiting materials. It was developed to answer the needs of the metalworking industry for a non-conversion process that will provide corrosion resistance and resistance to fingerprinting and abrasion on base metals, and electrochemically or chemically finished surfaces—without changing the appearance of the metallic surface.

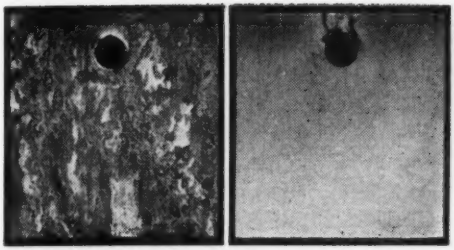
There are no hazards involved—Irilac is non-fuming, non-toxic, and requires no special fire prevention measures.

THE PROCESS

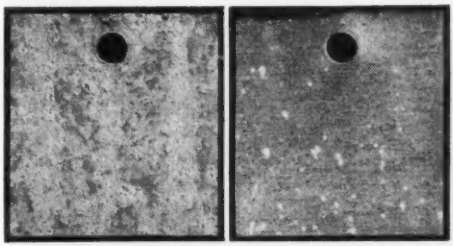
Irilac #1000 is diluted with water to provide a simple one-pass working solution. It is then applied by dip, brush or spray and forms a coating that quickly *bonds* to the metal surface without reacting with the surface.

THE PROPERTIES

The resulting coating is clear, transparent, thin yet durable. It has excellent water resistant properties, and can be rubbed, handled and subjected to rough treatment. The surface to which Irilac has been applied is not altered—in fact, the transparent coating brings full tone to colored surfaces and clarity to iridescent surfaces. The water-thin physical characteristic of the solution means that the coating provides protection in recessed areas that are difficult, if not impossible, to protect with other methods.



STEEL PANELS: bare (left) and coated with Irilac (right) after 8-hour salt spray.



ALUMINUM PANELS: bare (left) and coated with Irilac (right) after 168-hour salt spray.

WHERE IRILAC CAN BE USED

Irilac #1000 can be applied to *any* metal—wet or dry—treated or untreated. All metals can be processed in *one* operation in the same solution. It can be applied in conjunction with any process—over Iridite, anodized, phosphated surfaces, black oxide, etc. Surfaces treated with Irilac provide a good base for paint.

APPLICATION ADVANTAGES

No other process or material available for the protection of metals offers all the application advantages found in new Irilac #1000.

1. It can be applied to *any* clean metal simply by dip, brush or spray. No special equipment is required.
2. Saves time — just apply and dry — no reaction time required.
3. No hazards involved—no exhaust or special fire protection equipment is required. Irilac is non-fuming and non-toxic.
4. Saves space. Presents no disposal problem. Low in first and final costs.

Because of its versatility and complete safety, Irilac has unlimited uses. For example, it will protect aluminum furniture, brass hardware and fixtures, steel parts of all types, zinc castings, etc. In fact, any base metal or plated surface, or those treated with electrolytic or chemical post-treatments, can be improved or enhanced with Irilac.

IRILAC #1000 MAY BE THE ANSWER TO YOUR PROTECTION PROBLEM **Our development staff will be glad to work with you to determine the significant benefits Irilac can offer you. Simply send us some parts and let us show you what Irilac can do. No obligation, of course.**

Allied Research Products, Inc.

4004-06 EAST MONUMENT STREET
BALTIMORE 5, MARYLAND

***Manufacturers* of IRIDITE®, IRILAC™, ARP® Brighteners and Plating Chemicals — West Coast Licensee: L. H. Butcher Co.**

For more data circle 377 on Postpaid Card

any desired length and in belt widths of 10, 14, 18 or 22 inches. Components including straight "intermediate" sections, top curves, feeder sections, drives, take-ups, belts, idlers, floor supports, ceiling hangers, available.

Manufacturer: Alvey-Ferguson Co., 660 Disney St., Cincinnati 9, Ohio.

For more data circle **16** on Reader Service Card

★ ★ ★

Aluminum Etch Cleaner

Etchalume 14 is a strongly alkaline material for etching aluminum rapidly and uniformly without the formation of aluminum hydroxide scale or cake on the work, tanks or heating coils. A modified formulation introduced recently is said to be twice as effective in this respect and, in addition, has longer life.

The improved Etchalume 14 is a powdered material which is added to water. The bath can be operated over a wide range of concentrations and temperatures, depending upon the degree of etching desired.

The manufacturer recommends Etchalume 14 for cleaning and etching of aluminum prior to plating, anodizing, bright dipping, welding, phosphatizing and chromate conversion coating. It is effective for selective reduction in size of sheet or wire by etching. Its rapid etching properties are also used for chemical deburring and for etching of nameplates.

Manufacturer: Enthone, Inc., 442 Elm St., New Haven 11, Conn.

For more data circle **17** on Reader Service Card

VANTON SEALLESS PLASTIC PUMP RESISTS $FeCl_3$, PLATING CORROSIVES

Eliminates leakage, scoring, corrosion, maintenance problems, features:

- No stuffing boxes
- No shaft seals
- No valves or gaskets
- No metal parts in contact with fluid
- Non-agitating
- Self-Priming; high-vacuum
- Flexible liner absorbs abrasive action of suspended solids
- Non-contaminating

Now at last comes a pump designed to give you complete protection against leakage, corrosion, contamination, abrasion, maintenance problems.

Operating on a radically new design principle, which eliminates stuffing boxes and shaft seals, the Vanton pump is a low-cost, versatile, simple yet carefully engineered unit, problem-free with minimum maintenance. *Construction materials* include PVC, high-temperature polyethylene, Teflon (DuPont), Buna N, bakelite, or stainless steel, in capacities from ½ to 40 GPM.

What's *Your* Fluid Handling Problem? Vanton's Technical Service Can Help You Solve It!

Mr. Carl Tylka, Director Cooper Alloy Technical Service Dept.

Whatever your pumping, valving, or piping problem—equipment specification, construction material, circuit design and layout—Vanton's fully competent, experienced Technical Service staff can be of help to you.

Headed by Mr. Carl Tylka, this new Cooper Alloy service has been set up to assist industry in solution of fluid handling equipment, design, and operational problems. It typifies Cooper Alloy's forward-looking approach to cooperation between user and supplier.

To set the ball rolling, just write to Carl Tylka, Technical Service Director—and you'll get action!

Write for your free 8-page Vanton Catalog! It gives the whole Vanton story!

Also available: *Flex-Plug Plastic Gate Valve.* Combines gate valve's full flow with globe valve's throttle control. Write for Flex-Plug valve folder.

VANTON PUMP
and Equipment Corporation, A Division of
COOPER ALLOY
Corporation . Hillside, New Jersey

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everything it touches turns to

GOLD

Old King Midas would have flipped his crown to see how ready-mixed gold transforms ordinary surfaces into golden richness.
SEA-LAC ready-mixed gold comes in all shades of bronze powder – already mixed in the vehicle. Spray or dip; can be baked or air-dried. For use on aluminum, steel or zinc castings, polystyrene, acrylic and other plastics. Good package stability. In clear too – if you wish to do your own mixing. Available in smooth finish or one coat hammer effect.

SEA-LAC

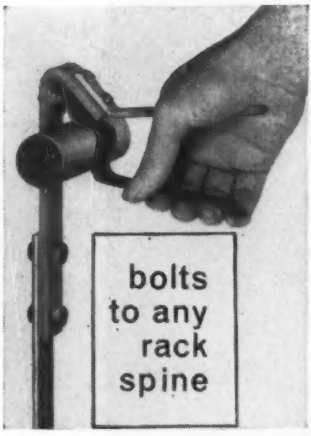
READY MIXED GOLD

DURALAC CHEMICAL CORPORATION, 84 LISTER AVENUE, NEWARK N. J.

For more data circle 379 on Postpaid Card

Spring-Clamp Cathode Hook

Description: Positive contact pressure between the cathode rod and cathode hook, so necessary for effective chrome plating, is assured by a spring-clamp cathode hook recently announced by Belke Manufacturing Co. The spring - clamp hook also keeps the racks from creeping or sliding together when a rod agitator is used.



Spring-Clamp Cathode Hook

Squeezing the spring - clamp lever opens the hook to receive the cathode rod. Releasing the lever locks the hook in place. To equip racks with Belke Spring-Clamp Hooks the present cathode hooks are cut off and the clamp hooks are bolted on.

Available for any size of rack spine and for 1, 1¼, 1½, and 2-inch cathode rods.

Manufacturer: Belke Manufacturing Co., 947 N. Cicero Ave., Chicago 51, Illinois.

For more data circle **18** on Reader Service Card

★ ★ ★

Protective Tape

ON-2 tape is designed to protect stainless steel curtain wall panels against damage in handling, shipping, fabricating, storage, construction and outdoor exposure.

The protective tape is easy to apply and remove, has an adhesive that can be removed with water-soluble detergents.

Manufacturer: Onco Products, Inc., 201 S. Main St., Middletown, Ohio.

For more data circle **19** on Reader Service Card

Rhodium
ELECTROPLATING SOLUTIONS
Technological knowledge acquired through many years of experience, plus special processes and equipment, assure the high quality of our Rhodium Plating Solutions.
Recommended for contact surfaces of switches, waveguide parts and other electrical applications, such as printed circuits...Can be applied in extremely heavy deposits, up to 100 milligrams per square inch.
Rhodium plating provides the advantages of whiteness, lustre and corrosion resistance of a precious metal.
Consult our staff, without obligation, about your specific plating problems.
SIGMUND COHN MFG. CO., INC.
121 SOUTH COLUMBUS AVENUE • MOUNT VERNON, NEW YORK
SINCE 1901 Specialists in the Unusual

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OVENS OF ALL TYPES

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Fire-Retardant Paint

A fire-retardant paint that will slow the spread of fires has been developed by Du Pont.

Approved by the Underwriters' Laboratories, the enamel does not stop fires but slows down the spreading rate.

It is available in seven colors and white. Du Pont recommends three coats for optimum results, says the product protects new or unpainted surfaces best.

Manufacturer: E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware.

For more data circle **20** on Reader Service Card

★ ★ ★

Primers for Fluidized-Bed Coatings

Primers for use beneath coatings applied by the fluidized-bed coating process have been announced by The Polymer Corporation. Preparatory coating increases adhesion and under-film corrosion resistance, according to the manufacturer.

At the same time the company introduced patching compounds for areas covered by holding hooks during the coating process.

Polymer has also announced the availability of tanks especially designed for application of the fluidized - bed coatings.

Fluidized - bed coatings are applied by moving a heated object through a fluidized bed of dry powders, which bond to the surface of the part. No solvents are used in the bed of powders, which are said to be in a state of "whirling suspension."

Powders available for coatings include cellulosic, vinyl, epoxy,

SOME MEN ARE LIKE BLISTERS . . . THEY DON'T SHOW UP UNTIL THE WORK IS DONE!

. . and you may be sure that your paint stripping job will be more efficiently done (and without blisters) when you use--

APEX "407" STRIPPER

This powdered, alkaline composition is designed for removal of Epoxy and Phenolic resin finishes, as well as light formations of rust and oxidation from steel parts.

Your Inquiry Will Be Appreciated!

Apex ALKALI PRODUCTS CO.

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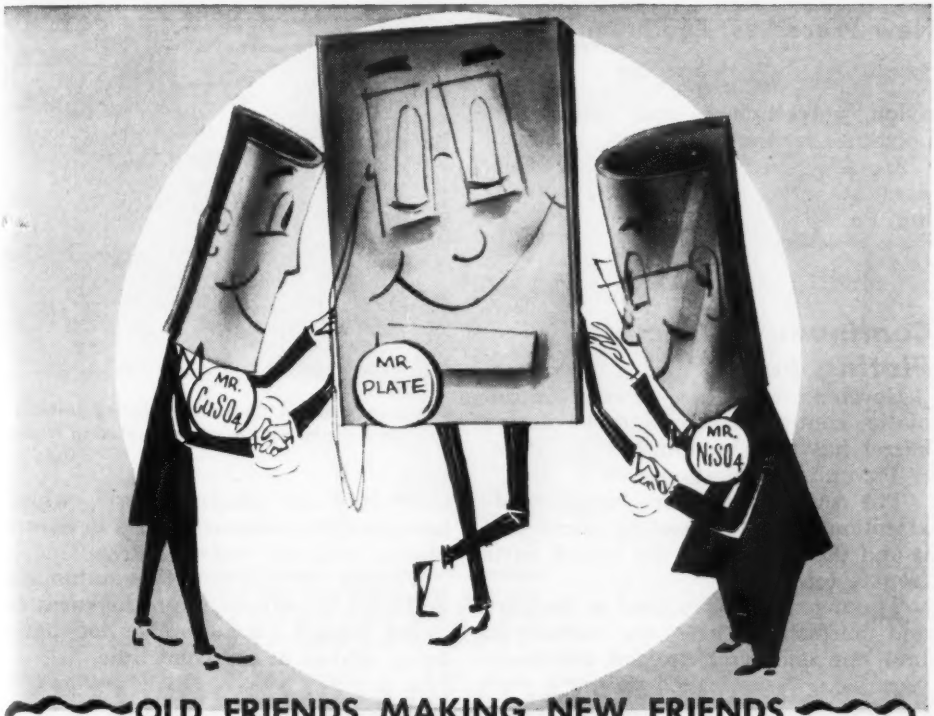

OLD FRIENDS MAKING NEW FRIENDS.

Copper and Nickel have been brought up together in the plating field. They plate, deposit, and alloy together—they are OLD FRIENDS.

TRIANGLE BRAND COPPER SULFATE and TRIANGLE BRAND NICKEL SULFATE as principal sources of copper and nickel in the plating field, are making NEW FRIENDS every day.

The reasons are obvious — purity, solubility, uniformity and high conductivity of their solutions result in QUALITY PLATING.

All-important "extras" found in the use of Triangle Brand Copper and Nickel Sulfates yield long-life plating performance that MAKES THE DIFFERENCE.

Specify: **Triangle Brand Copper Sulfate and Triangle Brand Nickel Sulfate for dependable plating baths.**

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For more data circle 383 on Postpaid Card

nylon, polyethylene, and chlorinated polyether resins.

Manufacturer: The Polymer Corporation, 2120 Fairmont Ave., Reading, Pa.

For more data circle **21** on Reader Service Card

★ ★ ★

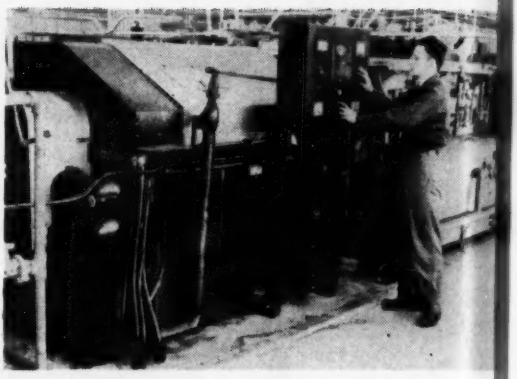
Continuous Chromium Plating Barrel

Development of a completely automatic continuous chromium plating barrel has been announced by Metal & Thermit Corporation.

The continuous plating barrel needs attention only for feeding parts into it and the removal of the plated parts from a tote box.

The machine is designed so that dry and burnished parts are introduced into one end, and are fed automatically into the plating barrel, which has specially designed baffles to assure plating without contact marks.

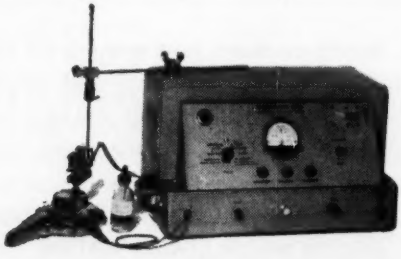
Timing of the barrel is automatic and can be adjusted for thickness of plate desired and number of parts being plated at any one time.



Continuous Barrel Chromium Plating Installation: M & T plating barrel (left), rinsing (right)

Test the Thickness of Plating . . . quickly, accurately

with the



KOCOUR ELECTRONIC THICKNESS TESTER

Why guess plating thickness when you can have accurate readings quickly? The Kocour Electronic Thickness Tester determines the thickness of chromium, silver, tin, cadmium, zinc, brass, copper, nickel, lead, and other plating. Readings are direct . . . accuracy 90-95%. Write for further information . . . no cost, no obligation. Ask for a demonstration or 15-Day Free Trial!

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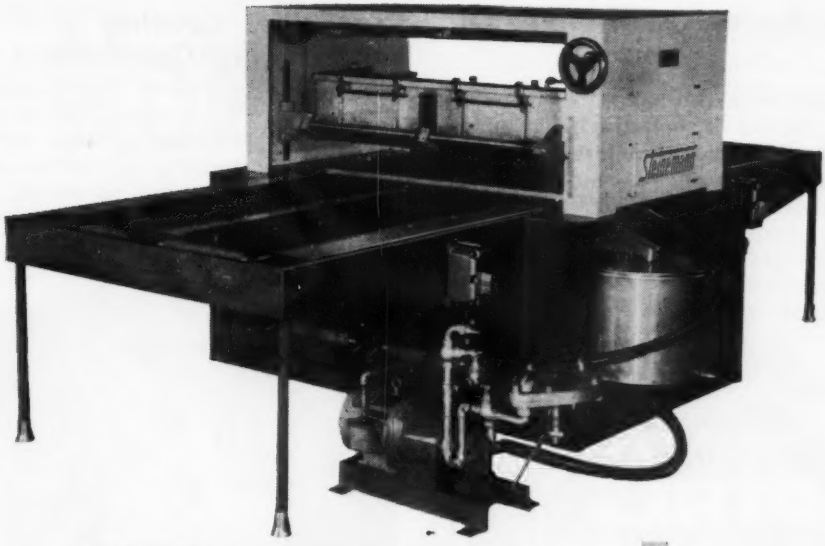

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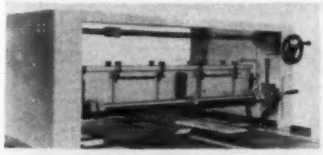
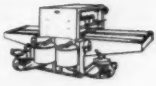
For precision organic finishing

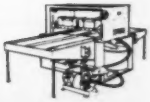
Flat and contoured products are finished with a speed and precision unequalled by any other process. Uniform coating is controlled to .5 mils thickness. Speed can be steplessly varied from 130 to 400 ft./min.

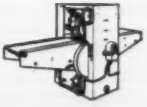
NO MIST! NO SPLASH! NO WASTE!

Unused material is returned to the reservoir for recirculation. One or two component polyesthers, vinyls, epoxy resins, lacquers or paints are applied to any flat or near-flat stock. Strict control of pressure, speed and viscosity produce a uniform coating that is matchless by another method.









Woodworking industries contact . . .

wilco machine works, inc.
Box 3722, Municipal Airport
Memphis, Tennessee

WRITE FOR LITERATURE AND DATA

Metal-working industries contact manufacturer

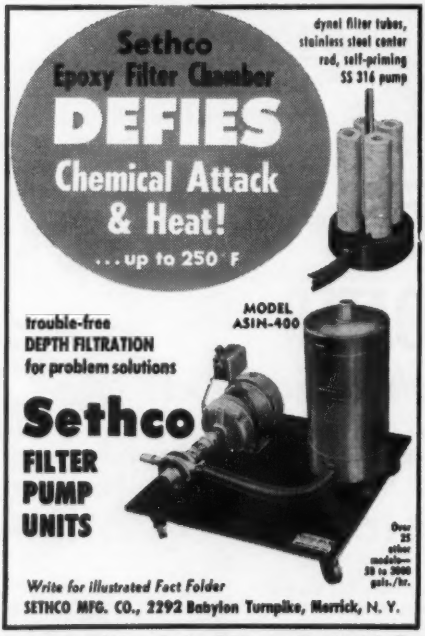
GEORGE **KOCH** SONS, INC.
Evansville 4, Indiana

For more data circle 385 on Postpaid Card

Capacity of the barrel is dependent upon the size of the parts being plated. Metal & Thermit reports that one producer now plates approximately 23,000 parts per hour, with each part being about one inch by a half inch by an eighth inch.

Manufacturer: Metal & Thermit Corporation, Rahway, N. J.

For more data circle **22** on Reader Service Card



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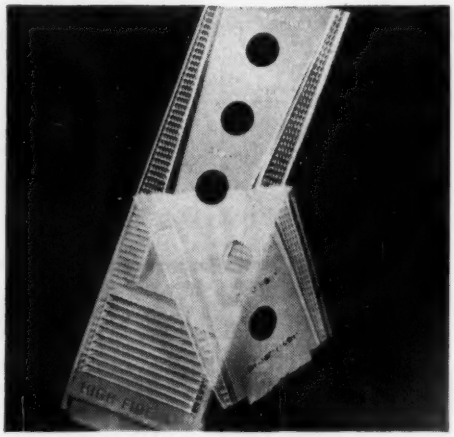
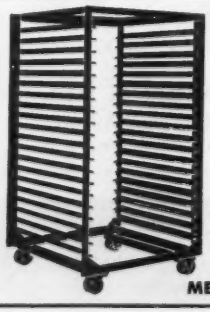
Protective Coating for Forming Operations

A strippable coating that is applied to metal before forming, drawing and punching operations protects metal from being scratched or marred during forming, adheres tenaciously, yet can be stripped off easily after these operations have been completed.



Plastisol Clear, a strippable coating recently introduced by Sherwin-Williams, was applied to this aluminum panel prior to forming. It is shown here partially removed. Coating protects against scratches, finger marking.

Called Plastisol Clear, the product is a polyvinyl chloride resin dispersion that can be applied by rolling, spraying, brushing, dipping and flow coat-



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Here is an entirely new type of tumbling media with unique advantages for deburring, grinding, burnishing, and dry lubricant coating. These new media are produced by an exclusive Dixon Sintaloy process which permits low-cost, mass production of shapes with characteristics scientifically controlled for barrel finishing requirements.

Exceptionally long life — plus added savings in shorter work cycles, reduced labor and prolonged life with repeated re-use.

Non-clogging — non-powdering — precise shape, uniformity and great durability minimize clogging, jamming, charging or discoloring work.

Greater efficiency — more uniform results — the ideal media for the job means faster more efficient cutting, more uniform finished parts.

Simpler standardized operation — no compensating for wear during runs — speeds, simplifies and saves labor and assures higher work quality.

Write or wire direct to factory for full data.

DIXON SINTALOY INC.

a subsidiary of The Joseph Dixon Crucible Company
537 Hope Street, Stamford, Connecticut

For more data circle 388 on Postpaid Card

ing. After application, the coated metal is heated to 350-375 deg. F. for two to three minutes.

The coating may be left on even after forming to guard the part against corrosion and marring during shipping and storage and protect the product until it reaches the user.

Removing the film is simply a matter of peeling it off after it has served its purpose.

Manufacturer: Sherwin-Williams Co., Cleveland 1, Ohio.

For more data circle **23** on Reader Service Card

★ ★ ★

Gold Electroplating Process

Lea-Ronal, Inc., has announced a gold electroplating process that is said to produce deposits with improved characteristics. The recently developed method is called the Auro-Glo Process. Lea-Ronal has patented the materials and techniques, expects that they will be particularly useful in electronics and decorative applications.

The bath used is stable and easy to operate, it is stated.

Deposits produced are improved in wear resistance and hardness, making it possible to use thinner coatings for equivalent performance, the manufacturer says. Heavier deposits are also possible with the process. Coatings as thick as 0.008 inch have been deposited with excellent adhesion.

Lea-Ronal states that deposits from the Auro-Glo Gold Bath have excellent solderability and weldability, do not bleed out, do not require extreme

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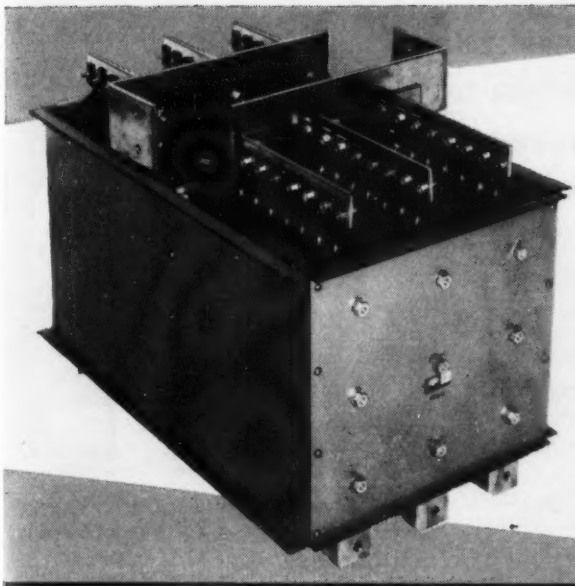

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HIGH CURRENT DENSITY

selenium rectifier replacement assembly

the top performance you need PLUS important cost savings

Lift out the old case, hook up the new Radio Receptor unit with fewer but higher current density cells, and you've got a power supply far more efficient with far longer life than you ever thought possible. It's the result of our unique vacuum process and manufacturing method.

For example: at 500 linear ft. per minute, just *nine* TRI-AMP cells in each stack do a far better job than 21 of the standard type—and their probable life expectancy is a tremendous 100,000 hours!

It pays to switch to this new Radio Receptor package *now*. Write for full information to Section P-2.

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GENERAL INSTRUMENT SEMI-CONDUCTORS

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semiconductor division

RADIO RECEPTOR COMPANY, INC.
Subsidiary of General Instrument Corporation
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General Instrument Corporation includes F. W. Sickles Division, Automatic Manufacturing Division, Radio Receptor Company, Inc. and Micamold Electronics Manufacturing Corporation (Subsidiaries)

For more data circle 390 on Postpaid Card

leaching. Numerous alloy colors may be produced.

Manufacturer: Lea-Ronal, Inc., 139-20 109th Ave., Jamaica 35, N. Y.

For more data circle **24** on Reader Service Card

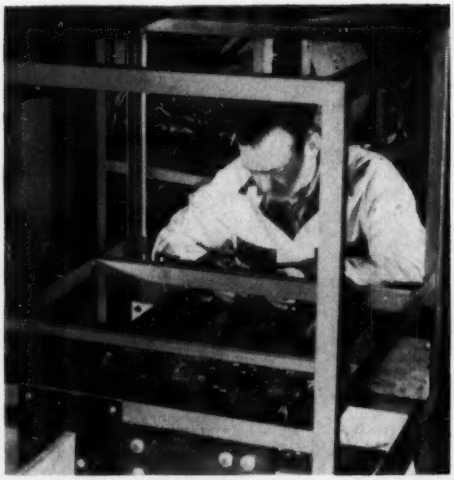
★ ★ ★

Silicon Rectifier

Description: A recently introduced silicon rectifier is said to have semiconductor elements that are free from aging.

In addition, the unit has a high efficiency rating, high voltage rating, will operate at ambient temperatures up to 200 deg. F.

Designed for easy accessibility, the silicon rectifier has a class B transformer, is equipped with a coil for each cell. Other features include individual fusing, pilot light failure indicator, single-phase protection and blower-type cooling fan.



Wagner Silicon Plating Rectifier: no aging, high voltage rating, high efficiency

Manufacturer: Allied Research Products, Inc., 4004-06 E. Monument St., Baltimore 5, Md.

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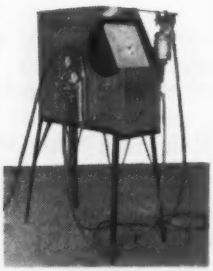
NOW . . . . *A Complete Paint Shop in ONE PACKAGE*



The #RH 2010 Machine has a 6-position mask holder, removable paint filter and six extra fiber filter pads, mask washer with built-in agitator. Complete with spray gun and air regulator and 20′ of air hose. We make any type masking or automatic painting equipment.

DUMATIC DEVICES INC.
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If you require your coatings to accomplish some specific task — something beyond mere ornamental appearance or average longevity—

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We make ACRYLIC, ALKYD, CELLULOSIC and VINYLOID coatings for a very wide range of specialized industrial applications.

The Varnish Products Co.

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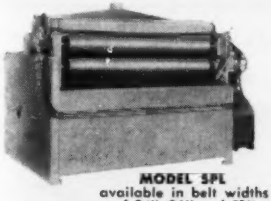
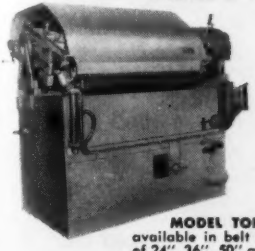
"Only machine capable of handling our rugged and precision sanding requirements on large aluminum panels"*

*Reported by
N. B. Barsha, Plant Engineer
Cupples Products Corp.
St. Louis, Mo.

TIMESAVER
SPEEDBELT
SANDERS



MODEL SPL
available in belt widths of 24", 36" and 50"
Sanding action is for underside of work.



MODEL TOP
available in belt widths of 24", 36", 50" and 54"
Sanding action is overhead.

"We were faced with the problem of sanding 1000 vertical aluminum panels, 28'x24"x3/16" for the exterior of the new U. S. Air Force Academy buildings. These panels required finishing to a uniform and precision surface specification. Before we purchased the Timesaver Model TOP-50, we thoroughly investigated the market for sanding machines of this type. The Timesaver "Speedbelt" was the only unit which possessed the durability, accuracy and rugged construction necessary for our requirements."

The Cupples Products Corporation's experience is typical of Timesaver "Speedbelt" Installations throughout the country . . . where performance and need to achieve production and cut costs is important. They can do all flat metal surface finishing, polishing and sanding formerly assigned to other methods . . . and do them better. What's more, savings made in labor, materials and maintenance soon pay for their low initial cost.

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Textured Coating

A metallic-texture finish with "three-dimensional" appearance has been introduced by Universal Paint & Varnish, Inc.

Trade named "Tri-Namic," this one-coat finish is available in many colors. It produces a consistent pattern.

Panel painted with Tri-Namel shows texture produced by this "three-dimensional" coating

Can be applied by spray to all "production" metals. May be air-dried or baked.

Manufacturer: Universal Paint & Varnish, Inc., Bedford, Ohio.

For more data circle **26** on Reader Service Card

★ ★ ★

Adjustable Joint for Spray Nozzle

An adjustable ball joint recently introduced by Spraying Systems Co. makes it possible to position a spray nozzle within a 40-degree included angle, permits 360-degree rotational movement.

The joint is available for 1½, 2, and 2½-inch NPT connections.

Ball Joint

Manufacturer: Spraying Systems Co., 3229 Randolph St., Bellwood, Ill.

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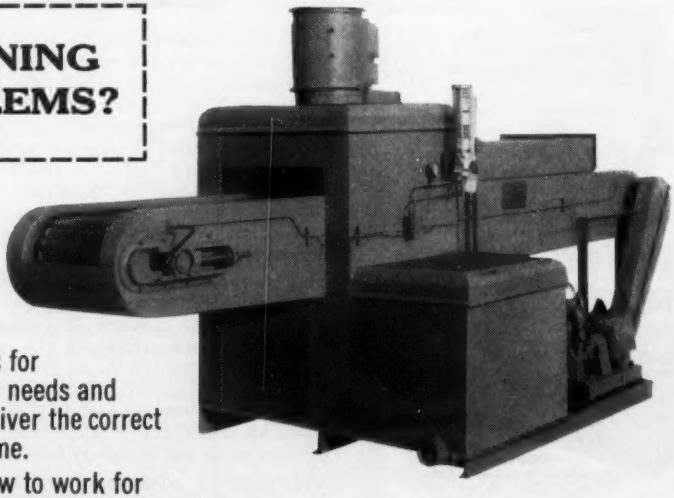
CLEANING PROBLEMS?



Discuss them with B & S Fabricators! You'll be pleased with our qualifications for interpreting your needs and our ability to deliver the correct equipment on time.

Put our know-how to work for you and turn a marginal operation into a profitable one.

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29125 Groesbeck Highway / Roseville, Michigan / DRexel 1-1444

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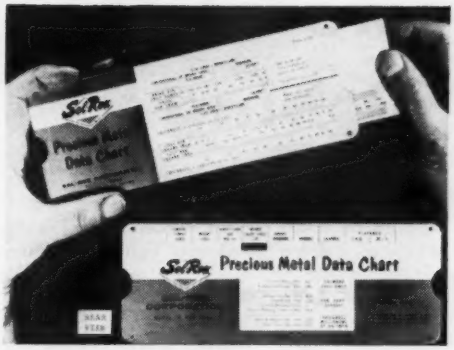
Slide Chart for Precious Metals Plating Costs. The cost of precious metals plating per unit area to specified thicknesses may be seen at a glance with a Precious Metals Data Chart recently announced by Sel-Rex Corporation, 75 River Rd., Nutley 10, N. J. Price, $1.00.

By simply setting the device to the price paid per troy ounce or gram, you read instantly the cost of plating gold, platinum, rhodium, silver and various precious metals formulations.

The copyrighted slide chart also gives cathode efficiency data; milligrams per square inch and grams per square foot of particular precious metals for 0.001-inch deposits; recommended current densities and actual plating time required for nine different precious metals plating formulations; and corresponding thicknesses, in millionths of an inch, of one milligram per square inch, and one gram per square foot, of the various precious metals.



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WILL STRIP IN MINUTES
OFTEN SECONDS

Electro Cold Stripper

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News of the Finishing Industry

- company news
- new positions
- new plants
- meetings

NEW PLANTS

Rohco Opens Detroit Warehouse

Herbert Geduld

R. O. Hull & Company, Inc., recently opened a sales office and service laboratory at 3136 Hilton Rd., Ferndale, Michigan, to supply Detroit, Toledo and the southeastern Michigan area.

The new district office offers analytical laboratory and warehouse facilities to handle Rohco plating specialties. It will also carry a complete stock of Enthone and related plating supplies.

Herbert Geduld, former Detroit representative, has been appointed district manager. Joe Manzella has been appointed technical representative. Glenn Berger, formerly with the Rohco Cleveland Laboratory, has been appointed analytical chemist.

Joe Manzella

Glenn Berger

NRC Equipment to Build Space Testing Facilities

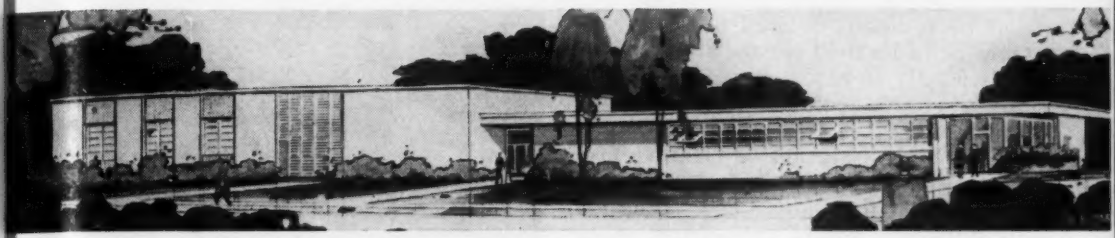
NRC Equipment Corporation, a subsidiary of National Research Corporation, has formed new engineering and sales groups to handle space testing facilities and products. These departments will be responsible for ultra-high-altitude test chambers, vacuum pumps, vacuum instrumentation and related accessories, and custom-designed environmental facilities for testing men, materials and products under conditions that may be encountered during space flight.

French Plant to Use Metasilicate Process

A new $1,000,000 plant recently built near Paris, France, by Sifrance, a company jointly owned by four French silicate manufacturers, will manufacture anhydrous sodium metasilicate using a process licensed from Cowles Chemical Co., Cleveland, Ohio, manufacturer of cleaning chemicals.

New Laboratory for Darco

Atlas Powder Company is building a new laboratory for expanded research on activated carbons at the site



Architect's drawing of Atlas Powder Company's new half-million-dollar Darco Experimental Laboratory under construction at Marshall, Texas. Completion is expected by late July.

of its present Darco Experimental Laboratory near Marshall, Texas. The company is a major producer of activated carbons. Completion is scheduled for late next July.

COMPANIES

Oakite Celebrates Fiftieth Anniversary

Oakite Products, Inc., celebrates its 50th Anniversary this month.

David C. Ball founded the company's forerunner, the Oakley Chemical Company, in February, 1909.

Cleaning in those days was done mostly by saponification, or the conversion of soils to water soluble soaps. When soils which could not be saponified began to present problems, the company developed Oakite, a forerunner of modern detergents.

Oakite added products to meet the demands of industry until today the company's family of cleaning compounds and chemical specialties numbers about 150, ranging from pickle control solutions for acid baths in steel processing to phosphate coatings for metals and compounds for decontaminating surfaces subjected to radioactivity.

Among the products standardized in 1958 are a cleaner designed for aluminum aircraft and other transportation equipment: a compound for cleaning baking pans and utensils; a compound designed to speed the removal of acrylic and epoxy resin finishes; an electrocleaner for steel; a lubricant for metal drawing and forming operations; a pre-plating cleaner for zinc die castings; and a rust-retarding cleaner for steel.

The company's attention to research

Oakite's customer service laboratory develops an average of 12 new products a year to solve the problems presented by new soils on new surfaces.

has been closely related to the development of its field service staff.

It is only in actual in-plant use that the chemists' compounds can prove themselves.

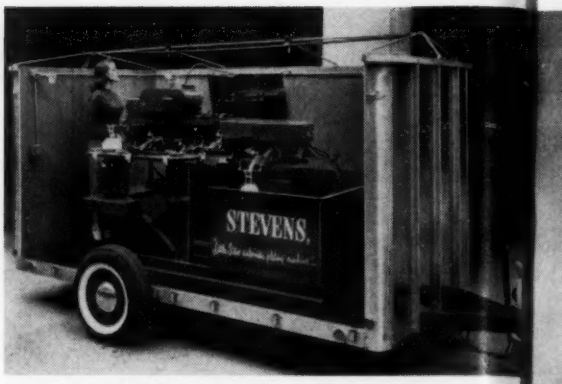
The busiest section of Oakite's laboratories is that devoted to customer service. To this laboratory, equipped to duplicate actual processing operations, come problems that lead to the surface treatments of tomorrow.

Stevens Puts "Little Steve" Automatic Plating Machine on Wheels

Frederic B. Stevens, Inc., Detroit manufacturer of metal finishing equipment and supplies, has mounted "Little Steve," a standard, ten-foot-long automatic plating machine on a car-drawn trailer.

"Little Steve" is completely wired and ready for operation. The mobile unit will be used for demonstration purposes.

The compact automatic has an automatic load and unload device and an automatic skip-track mechanism that permits selective plating and/or processing. The "Little Steve" trailer will be sent out on regularly scheduled trips to plants of customers and prospects.



Automatic Plating Machine on Wheels: "Little Steve" visits Stevens' customers and prospects

Anyone interested in having a demonstration should contact the Sales Department, Frederic B. Stevens, Inc., Detroit 16, Michigan.

V. J. Dolan Increases Capacity

V. J. Dolan & Co., Inc., Chicago paint manufacturer, recently installed high-speed cutters and mixing equipment plus additional storage tanks in order to increase capacity of the plant.

Airless Spray to be Demonstrated at Western Metal Show

Nordson Corporation will demonstrate airless spray painting in its booth at the Western Metal Congress & Exposition, to be held at the Pan-Pacific Auditorium in Los Angeles, March 16-20.

INDUSTRIAL ABRASIVE COB PRODUCTS

- **COB GRITS (Blasting)**
- **COB FLOUR (Foundry)**
- **COB MEAL (Tumbling)**

For Plastics and Metals Finishing

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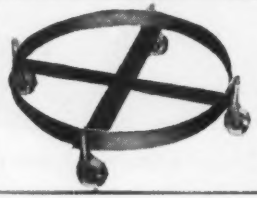

MORSE DRUM DOLLY No. 13

Perfect for vertical handling of open end drums. Easily handles loads up to 700 lbs. Built of 2½" steel for long life. 24" diameter; overall height 6½". Has four 3" dia. steel swivel casters for easy rolling into small areas. Rubber wheels available.

MORSE MFG. CO., INC. $10.90 FOB

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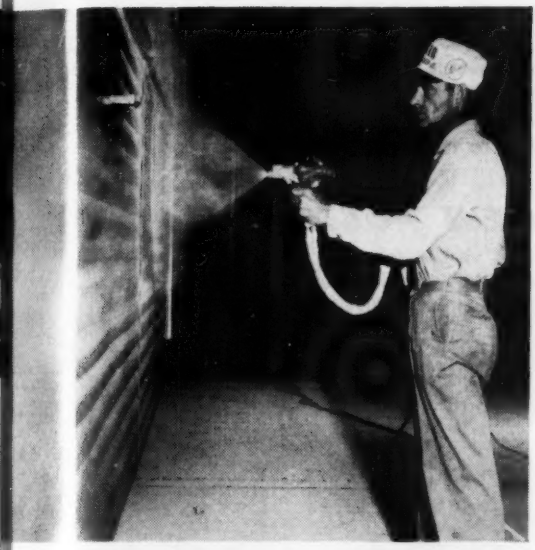

Operator uses airless spray painting method to finish mobile home. This process will be demonstrated at Western Metal Show. (Photo courtesy Nordson Corporation, Amherst, Ohio.)

The demonstration will be designed to show the advantages of the airless spray process, which uses no air for atomization. Airless spray's principal advantage, according to Nordson, is reduction of overspray and exhaust requirements.

New Sales Office for Dow in Charlotte, N. C.

The Dow Chemical Company has opened a sales office in Charlotte, North Carolina. The new office will be in the Wachovia Bank Building.

T. H. Caldwell, Jr., has been appointed manager of the office, moving up from his former post as manager of automotive chemicals sales.

Diversey Buys British Corporation

The Diversey Corporation, Chicago manufacturer of chemical products and detergents for industrial use, recently acquired Deosan Limited, London, England, manufacturer of cleaning and sterilizing materials.

Roto-Finish Buys Ransohoff

Roto-Finish Company, Kalamazoo, Michigan, manufacturer of barrel finishing equipment, has purchased Ransohoff, Inc., Hamilton, Ohio, manufacturer of phosphatizing, pickling, paint finishing and foundry equipment.

Gunther Balz, president of the combined companies, said that no material changes are contemplated in the personnel or operations of the Ransohoff plant. R. E. Wigger, vice president of Ransohoff, Inc., will be executive vice president of the new Ransohoff Company.

Acquisition of Ransohoff, Mr. Balz stated, makes it possible for his firm to provide engineering and manufacturing facilities for a complete line of metal treating machinery.

Wyandotte's J. B. Ford Div. Celebrates Increased 1958 Sales

Sales managers from Wyandotte Chemicals' J. B. Ford Division recently gathered at the St. Clair Inn, St.

TRUE BRITE BRASS SOLUTION

A foolproof solution which has been in use for over 6 years in light and heavy production.

- Ready To Use—Just Add Water
- No Variance in Color
- Trouble-Free—Little Supervision Needed
- Low Cost—Additions only once a day

Available in a variety of colors. Will match your sample.

Write for technical bulletin and prices.

TRUE BRITE CHEMICAL PRODUCTS CO.
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District Sales Manager W. C. Van Keuren of Wyandotte Chemicals' J. B. Ford Division receives trophy for outstanding performance in 1958 from General Manager Ford Ballantyne, Jr. The J. B. Ford Division's sales manager, Fred Tholen, observes at right.

Clair, Michigan, for their Annual Conference, heard General Manager Ford Ballantyne, Jr. happily comment on the division's 1958 increase in sales (over 1957).

Taking top honors and the trophy for the year, the division's New York office was adjudged the most outstanding of the 16 district offices, with sales "appreciably ahead" of 1957.

NEW POSITIONS

Wyandotte Chemicals Corporation, J. B. Ford Div., reassigned three sales managers: **W. C. VanKeuren** from New York to Los Angeles, **James S. Hubbard** from Boston to New York, and **James L. Ramsey** from Wyandotte, Mich., to Boston.

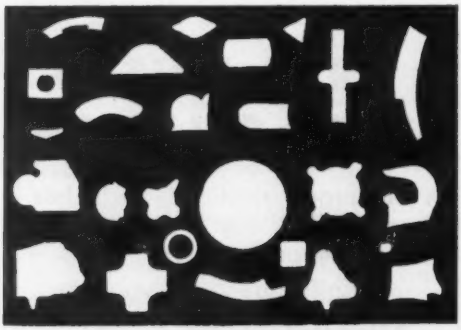
W. C. VanKeuren

James S. Hubbard

Dr. Robert J. Rohr

James L. Ramsey

Dr. Robert J. Rohr has been appointed director of research and development by **Magnus Chemical Company, Inc.,** Chicago manufacturer of cleaning compounds.



Pre-Cut Masks Speed Finishing

Brady Pre-Cut Masks are self-sticking — go on fast and accurately. Protect from finishing to inspection. Hundreds of shapes and sizes in stock, for paint spraying, baking, tumbling, etc. Specials made to order. Fast delivery. Distributors in 150 cities.

Write for free samples and Bulletin 160-C.

W. H. Brady Co.

746 W. Glendale Ave. • Milwaukee 9, Wis.

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A. E. S. GOLDEN JUBILEE CONVENTION, 5th Industrial Finishing Exposition Detroit, Michigan, June 14-19

Carleton A. German has been promoted to industrial sales manager of **Solventol Chemical Products, Inc.**, Detroit manufacturer of cleaners.

Carleton A. German

Jerry Kellam

The Pioneer Rubber Company of Texas has appointed **Jerry Kellam** as sales representative in New Orleans. His territory includes Arkansas, Louisiana, Mississippi, western Tennessee and the Houston, Texas area.

★ ★ ★

American Buff Company appointments and transfers include **Rudy Cernick** for eastern Michigan and western Ohio; **Harry Parsons** from Ohio-western Pennsylvania territory to New England (Connecticut, Rhode Island, Massachusetts) territory; **Robert Hulland** from eastern Michigan territory to upstate New York and eastern Ohio territory; **Glen Beckwith** for state of California.

★ ★ ★

Thomas E. Neal appointed general sales representative for **Engelhard Industries, Inc.**, in Florida, Alabama, Georgia and South Carolina.

★ ★ ★

Charles Masek, Robert Ziegeweid and **Frank G. Pollard** have recently joined **Wyandotte Chemicals Corporation, J. B. Ford Division.** Messrs. Masek and Ziegeweid will be sales representatives.

Mr. Masek will work in Wyandotte's Cleveland, Ohio, office, and Mr. Ziegeweid will represent the J. B. Ford Division's Industrial Dept. in the Minneapolis, Minnesota area.

Frank G. Pollard

YOUNG BROTHERS *Baking and Drying* **OVENS**

designed and built for every product and process requirement

Batch and Conveyor types up to 1000° F.

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Over 60 years of service

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Robert Ziegeweid

Charles Masek

Arthur W. Reckling

C. H. Neffenger

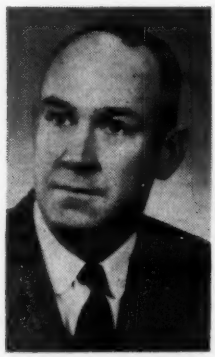
Mr. Pollard is a recent addition to Wyandotte Chemicals (J. B. Ford Division) Industrial Research staff, at the corporation's Wyandotte, Michigan laboratory.

★ ★ ★

G. S. Equipment Company and affiliates **General Supply Co.** and **G. S. Plastics Co.** have promoted **C. H. Neffenger** to general sales manager and appointed **Robert F. Pyle, George D. Stevenson** and **Arthur W. Reckling** as district sales managers.

Mr. Neffenger and the district managers will have sales responsibilities for all three of the Cleveland firms.

Robert F. Pyle



George D. Stevenson

Mr. Pyle will work in central Ohio and the west side of Cleveland. Mr. Stevenson will manage sales in eastern Ohio, western Pennsylvania and the east side of Cleveland. Mr. Reckling will handle sales in northwest Ohio, eastern Indiana, southern Michigan and Detroit.

★ ★ ★

John Stuart Smart, Jr. has been appointed general sales manager of

"IMPERATIVE"

"My foreman, Glenn Holland, has gotten such a good electroplating background from your course that I feel it imperative to take the course myself. Please enroll me at once," writes job shop owner H. Hammer of N.Y.C. If you want a good plating background in a hurry, ELECTROPLATING KNOW HOW, the unique home study course, is the easiest way to get it! Write Dr. Joseph B. Kushner, Box 2066, Evansville 14, Ind.

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• COMPLETE SYSTEMS
• WASHERS
• BOOTHS
• OVENS

SERVING AMERICAN INDUSTRY FOR MORE THAN A QUARTER OF A CENTURY

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American Smelting and Refining Co. Ralph L. Wilcox has been named assistant sales manager.

Mr. Smart will be responsible for the administration of the Sales Department and for the sales of the company's major metal products and the by-products of primary metal smelting and refining.

★ ★ ★

Dr. Frederick M. Robbins and **Herbert L. Jones, Jr.** have been appointed senior chemists in the product development department of **Atlas Powder Company's** Chemicals Division.

★ ★ ★

Robert C. Trow has been elected vice president of **King-Seeley Corporation,** Ann Arbor, Michigan.

Mr. Trow was formerly assistant general manager of the Queen Products Subsidiary of King-Seeley Corporation.

Robert C. Trow

Robert J. Lickteig

Robert J. Lickteig, formerly sales manager for the Scotsman Ice Machine line has also been named vice president of the parent corporation.

Fayville A. Trow, founder and former president of Queen, will continue with the Division in a consulting capacity.

★ ★ ★

J. R. Desjardins has been appointed manager of the North Central District, **The Lowe Brothers Company,** Dayton, Ohio, paint manufacturer.

The New England District, formerly managed by Mr. Desjardins, will be consolidated and its operations combined with the firm's Eastern District, managed by **S. R. Bolick.**

J. R. Desjardins

S. R. Bolick

★ ★ ★

Sharpe Manufacturing Co. has appointed **J. W. Dayton** regional sales manager.

"PHOSPHOR-BRITE"

Write for details on how you can obtain a test supply sufficient to fill one tank.

The New Univertical Rolled Copper Anode for Acid Baths

Prompt shipment from stock in lengths and shapes to suit your requirements.

Virgin metals used exclusively

UNIVERTICAL

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Mr. Dayton will headquarter in Los Gatos, California and handle Sharpe sales in northern California.

★ ★ ★

Hugh V. McGuire has been appointed assistant to the sales manager of **Enthone, Inc.**, New Haven, Connecticut, subsidiary of **American Smelting and Refining Company.** He will specialize in the marketing of finishing equipment and accessories manufactured and distributed by the equipment department of Enthone.

Kenneth D. Miller has joined Enthone as design engineer in the equipment department.

★ ★ ★

Robert H. Ebersole has been named district manager of the Detroit sales office of the Federated Metals Division of **American Smelting and Refining Company.**

Donald E. Stocking has been appointed sales manager of the Rochester Division, **Consolidated Electrodynamics Corporation.**

Mr. Stocking was formerly manager of the company's district sales office in Buffalo, N. Y.

★ ★ ★

Schaffner Manufacturing Co., Inc. has announced the election of **James R. Schaffner** as secretary-treasurer of the company and the appointment of **Peter J. Verlinich** as director of public relations.

Kenneth D. Miller

Hugh V. McGuire

James R. Schaffner

Peter J. Verlinich

★ ★ ★

Two changes in the board of directors of **The Dow Chemical Company** were announced with the retirement from the board of **Dr. E. O. Barstow** of Midland and **R. L. Curtis** of San Francisco.

"GRIPALLOY"

. . . Attractive satin sheen ETCHING PRIMER in black and colors . . . Often used as finish coat . . . Air dries in minutes . . .
. . . Amazing tight adhesion to 25 different metals as reported by a large electrical manufacturer.
. . . Excellent resistance to Salt Spray, Gasoline, and Solvents . . .

TENAX, Newark, N. J.
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THERMOSTATS
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for
CHEMICAL SOLUTIONS
Accurate — Dependable

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Mr. Barstow also retired as vice president but was named to the newly created position of honorary chairman of the board.

Mr. Curtis simultaneously retired as general manager of Dow's Western Division but retains a vice presidency and will remain as senior officer on the West Coast.

Elected to replace the two retired directors are **Donald K. Ballman,** director of sales, and **C. B. Branch,** manager of the plastics department. Replacing Mr. Curtis as Western Division general manager will be **Leland A. Doan,** assistant general manager of the Division since 1955.

MEETINGS

Program Announced for A. E. S. Dixie Regional

Speakers and topics for the educational session of the Dixie Regional Meeting of the American Electroplaters' Society have been announced by William F. Kelly of the Southeastern Branch, A.E.S.

The regional meeting, the first for this group, will be held on February 13 and 14 at the Dinkler Plaza Hotel in Atlanta, Ga.

Speakers and their subjects are as follows: Dr. Abner Brenner of the Na-

Dr. Abner Brenner

Dr. H. J. Wiesner

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BLACKENING SALT

Black Oxide finishing for rust resistance and decorative parts. Speedy black coating in water solution with no electric current. Permanent black finish on ordnance parts, tools, aircraft, bearing races. Dazzling black decorative finish for television cameras, business machines, hardware, metal screens and machine parts. Excellent bond for paints and enamels. Simple one bath operation. Write for bulletin H-16. Park Chemical Co., 8074 Military Ave., Detroit 4, Mich.

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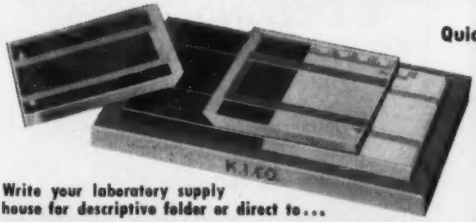

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tional Bureau of Standards, Washington, D. C., will present a talk on his trip to Russia, where he attended a conference on corrosion and protection of metals; R. T. Gore, Metal & Thermit Corporation, Rahway, N. J., will speak on *Alloy Plating*; and Dr. Harold J. Wiesner, research chemist for Bendix Aviation Corp., South Bend, Indiana, will present a talk on *Hard Anodizing of Aircraft Components.*

The Sixth Annual Interim Meeting of the A.E.S. will be held on February 14, with the Southeastern Branch as host branch.

John P. Nichols

Dr. F. A. Lowenheim

Dayton Branch A.E.S. Annual Meeting

The 13th Annual Educational Session and Dinner Dance of the Dayton Branch, American Electroplaters' Society, will be held on March 7 at the Hotel Biltmore, Dayton, Ohio.

Bennie Cohen and Byron Bowman are in charge of the annual meeting, and John P. Nichols, executive secretary of the A.E.S., is honorary chairman.

The Educational Session will begin at 1:30 P.M. Educational Chairman Lawrence H. Hadlock has arranged the following program:

Corrosion of Plated Finishes, by Dr. F. A. Lowenheim, Metal & Thermit Corporation.

Stripping of Organic Coatings, by William K. Murray, Enthone, Incorporated.

Factors Affecting Job Plating Costs, by Ezra A. Blount, editor, PRODUCTS FINISHING.

W. K. Murray

Ezra A. Blount

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OXIDIZING COPPER, SILVER, BRASS, BRONZE
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McKeon's "Liquid Sulphur"
Processes described in detail.
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McKeon Bldg., 621 W. Pittsburgh St., Greensburg, Pa.

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PROTECT EYES AGAINST PAINT SPRAY, dust, fumes, gas, smoke, etc. Can be worn with any make respirator or mask. Soft, pliable rubber frames give air-tight fit on any shape face. A few drops of water on inside of lenses keep fog off by a simple nod or shake of head. Sample $2.00 postpaid! Order today!

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A. E. S. Tri-State Regional Meeting Program Announced

The 5th Annual Tri-State Regional Meeting will be held on April 4 at the Sheraton Hotel in Louisville, Ky.

Registration will be held from 10:00 A.M. to 1:00 P.M. in the hotel.

At 2:00 P.M., the educational session will begin. H. E. Head, A. E. S. president, will be honorary chairman of the session.

Speakers and their topics are as follows: Dr. Henry Brown, Udylite Research Corporation, will speak on *Mechanism of Electrodeposition with Nickel and Chromium and the Corrosion Resistance of the Deposits*; Eugene L. Combs, Diamond Alkali Co., has as his topic *Chromium Plating up to Date*; James H. Peacock, Duriron Co., *Metals and Plastics for Handling Plating Solutions.*

The meeting will conclude with a banquet, show and dance in the Ballroom of the Sheraton Hotel at 7:00 P. M. (Louisville is on Central Standard Time).

Eugene L. Combs

Dr. Henry Brown

Papers on Abrasives and Abrasive Finishing Heard By Boston Chapter of ASFA

The Boston Chapter of the Ameri-

SPRAY MASKS
REDUCE YOUR MASKING COSTS BY USING INEXPENSIVE, HEAT RESISTANT
KWIKY-DOTS
A raised edge is automatically provided on each disc for easy grasping. Connected strings of several discs may be removed for fast application. Stock Size: ⅛" up.
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can Society for Abrasives has recently heard several excellent papers on abrasives and abrasive finishing, according to Richard Clancey, publicity chairman for the group.

Philip E. Bloom

Papers presented at meetings during the current season have included one on tumbling and barrel finishing, presented by a speaker from the Roto-Finish Company; one on abrasive cutoff wheels, by a speaker from American Chain & Cable Co., Allison Div., and a paper on man-made diamonds presented by a speaker from General Electric Co.

Man responsible for arranging the excellent programs is Philip E. Bloom, chairman of the group's Executive Committee.

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PURE TITANIUM

• BOLTS • NUTS • STUDS • WASHERS

PRICE EACH IN 1,000 LOTS—ANY COMB.
100-999 + .05 EA. — 1-99 + .10 EA.

TYPE	SIZE	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"
THUMB SCREWS	1/4"-20	.55	X	X	X	X	X
	5/16"-18	X	1.10	X	X	X	X
HEX HEAD BOLTS	10-24	X	.21	X	.25	X	X
	1/4"-20	.25	.30	.33	.36	.48	X
	5/16"-18	X	X	.56	.63	.75	.86
STUDS	10-24	X	.10	.11	.12	X	X
	1/4"-20	X	.12	.13	.14	.19	.22
	5/16"-18	X	X	X	.41	.53	.65

ALL ITEMS SHIPPED FROM STOCK

HEX NUTS	10-24	.16
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ROUND WASHERS	3/16"	.06
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HONORS

William Blum Receives Electrochemical Society Award

Mr. Electrochemistry, Dr. William Blum, has been honored for the second time in a year, receiving a newly established Electrochemical Award from the Washington - Baltimore Section of the Electrochemical Society. In May, Dr. Blum received the First A.E.S. Scientific Achievement Award during the Annual Convention of the American Electroplaters' Society.

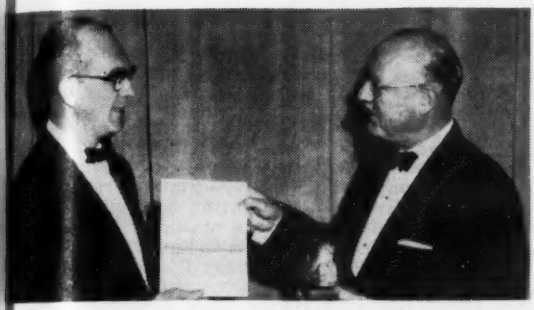
Dr. William Blum

The Electrochemical Society's Baltimore-Washington Section has announced that the semi-annual award in recognition of outstanding contributions to electrochemistry would be named the "William Blum Award," in honor of its first recipient.

Dr. Blum joined the staff of the National Bureau of Standards in 1908, remained until his retirement in December 1951, at which time he was chief of the Electrodeposition Section and assistant chief, Chemistry Div.

His entire career has been one of dedicated service to his government, science, and electrodeposition.

His scientific endeavors have produced over 100 publications, dealing with various phases of the theory and practice of electrodeposition. With George B. Hogaboom, he published "Principles of Electroplating" in 1924.



Donald S. Carmichael, secretary and general counsel of Diamond Alkali, receives award from R. J. Anderson, editor of Financial World

"Bronze Oscar of Industry" Awarded to Diamond Alkali

"Bronze Oscar of Industry" Award, nationally famed Annual Report Award sponsored by *Financial World,* has been presented to Diamond Alkali Company, Cleveland, Ohio, producer of industrial and agricultural chemicals for its 1957 Annual Report.

The Diamond report, according to this prominent publication, was one of the best of its kind in the country and one of the top two for general excellence in the chemical industry.

NECROLOGY

Van Winkle Todd

Van Winkle Todd

Van Winkle Todd, 66, chairman of the board, Hanson - Van Winkle - Munning Co., died on January 15, in Longbranch, N. J. He was president of of the company from 1927 to 1948, chairman of the board of directors from 1948 until his death. Mr. Todd was a member of the American Electroplaters' Society and the Electrochemical Society.

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"Customer still raving about the wonderful lacquer job."

*Name on application.

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MEETINGS of INTEREST to FINISHERS

Feb. 13-14. Annual Educational Session and Banquet, Dixie Regional Group, A. E. S., Dinkler Plaza Hotel, Atlanta, Ga.

Feb. 14. A. E. S. Sixth Interim Meeting, Sponsor — Dixie Regional Group, Host — Southeastern Branch, Dinkler Plaza Hotel, Atlanta.

Mar. 7. Annual Educational Session and Banquet, Rockford Branch, A. E. S., Faust Hotel, Rockford, Ill.

Mar 7. 13th Annual Meeting and Dinner-Dance, Dayton Branch, A. E. S., Hotel Biltmore, Dayton, Ohio.

Mar. 21. Annual Educational Session and Banquet, Los Angeles Branch, A. E. S., Beverly-Hilton Hotel.

Apr. 4. Fifth Tri-State Regional Meeting, A. E. S., Host — Louisville Branch, Louisville, Ky.

June 14-19. Golden Jubilee Convention and Industrial Finishing Exposition, Fifth International Conference on Electrodeposition, Detroit, Mich.

Circle numbers on postpaid card inside back cover to obtain free literature

PRODUCT LITERATURE

35. Masking Aids
"Time-Saving Masking Aids for Better Product Finishing" is the title of an illustrated brochure that describes masking discs, plugs, caps, corks, tape. Includes information on tape dispensers. By-Buk Co., 4314 W. Pico Blvd., Los Angeles 19, Calif.

36. Cleaning Machinery
Information on the company's line of mechanical washers. B & S Fabricators, Inc., 29125 Groesbeck Highway, Roseville, Michigan.

37. Conveyor Planning Folder
Illustrated catalog includes explanatory diagrams, plant and conveyor planning grid, sheets for preliminary layouts. Chainveyor Corporation, 5618 E. Washington Blvd., Los Angeles, Calif.

38. Buffs
Data sheet describes Buff Type No. 20-DOTA, a heavy-duty buff made of sisal twine, used for finishing steel, brass, aluminum. Geo. R. Churchill Co., Inc., Dept. PF-29, Hingham, Mass.

39. Water-White Lacquer
Information on Daconite 5600 clear lacquer, a ready-to-spray lacquer that is said to have excellent paleness and color retention. James B. Day & Co., 1872 Clybourn Ave., Chicago 14, Ill.

40. Ovens
Bulletin C describes various standard ovens for production heating and drying applications requiring temperatures up to 750 deg. F. Despatch Oven Co., Dept. 53E, 619 S. E. Eighth St., Minneapolis 14, Minnesota.

41. Vapor Degreasing
"Vapor Degreasing with Diamond Perchlorethylene" is the title of a 12-page technical bulletin that presents data on 13 major advantages of vapor degreasing prior to painting, plating and other finishing operations. Includes sections on essentials of vapor degreasing equipment, methods of scheduling vapor-degreaser cleanouts and solvent distillation, suggested operating procedures. Diamond Alkali Co., Chlorinated Products Div., 300 Union Commerce Bldg., Cleveland 14, Ohio.

42. Sintered Tumbling Shapes
Bulletin describes a new type of sintered metal tumbling media that is produced by a special sintering process. Technical data included is based on field tests of the media. Dixon Sintaloy, Inc., 537 Hope St., Stamford, Conn.

43. Ready-Mixed Gold
Information on Sea-Lac ready-mixed gold finishes for application by spray or dip. Duralac Chemical Corp., 84 Lister Ave., Newark, N. J.

44. Germanium for Semiconductors
A technical information bulletin which describes the physical characteristics and purity standards of germanium and germanium dioxide used in the manufacture of semiconductor devices. Sylvania Electric Products, Inc., Towanda, Pa.

45. Immersion Heaters
Bulletin describes and gives specifications for acid- and alkali-resistant quartz immersion heaters. Glo-Quartz Electric Heater Co., Inc., Willoughby, Ohio.

46. Rectifier Conversion Kit for Electroplaters
Catalog on silicon conversion kits for plating rectifiers. Dresser Electric Co., 2705 Wight St., Detroit 7, Michigan.

47. Pearlescent Finishes
Information on Nacromer YNC, an additive that is used in standard organic finishes to produce a pearlescent finish. The Mearl Corporation, 124 E. 40th St., New York 16, N. Y.

48. Pressure Curtain Coater
Data File SIF-7 contains complete data on the Steinemann-Koch pressure curtain coater, which applies a uniform coating of lacquer or synthetic material on flat or moderately curved work. Patented Swiss process in which a vertical film is poured onto the work from adjustable orifices as the work passes through the machine. George Koch Sons, Inc., Evansville 4, Indiana.

49. Multiple-Process-Cycle Plating Machine
Information on the Select-O-Matic automatic plating machine, which allows the operator to select any one of several plating cycles when he loads the machine, merely by turning a dial. Lasalco, Inc., 2820 LaSalle St., St. Louis 4, Mo.

50. Red Primer
Information on the advantageous features of Napry Red Primer. Lowe Brothers Co., Dayton 2, Ohio.

51. Finishing Systems
Catalog No. A-658 discusses the advantages of complete, conveyorized finishing systems. Includes data on cleaning and pickling equipment, ovens, spray booths, air-supply systems, complete systems for painting, porcelain enameling, flow and dip coating. The R. C. Mahon Co., Detroit 34, Mich.

52. Clear Protection
Information on 2105 Clear Lacquer for the protection of brass, silver, bronze and copper. G. J. Nikolas & Co., Inc., 2880 Washington Blvd., Bellwood, Ill.

53. Automatic Polishing
Information on automatic polishing and buffing machines. Packer Machine Co., Meriden, Conn.

54. Barrel Finishing Catalog
A 24-page catalog on barrel finishing sets forth a clear explanation of mechanical finishing processes, tells how barrel finishing can be used in grinding, deburring, descaling, polishing and coloring of metal parts. Includes data on Roto-Finish barrel finishing machines, chip bins, separators, dryers, screens and so on. Roto-Finish Co., 3704 Milham Rd., Kalamazoo, Mich.

55. Belt Sanders
A 4-page folder describes Model TOP Timesaver "Speedbelt" Sander. It details the construction features of this unit, gives specifications for four models. Several applications are shown. Timesaver Sanders, P. O. Box 7446, Robbinsdale Station, Minneapolis 22, Minn.

56. Technical Data on Hot Spray
Revised edition of the booklet "Why Hot Spray?" includes technical information on the advantages and possibilities of hot spray painting process. Spee-Flo Co., 6614 Harrisburg, Houston 11, Texas.

57. Air Sanders
Data on portable air-operated sanding machines. Pneumatic Products Div. of Sundstrand Machine Tool Co., 2531 Eleventh St., Rockford, Ill.

58. Acrylic Coatings
Performance and application information on acrylic-based coatings. The Varnish Products Co., 5204 Harvard Ave., Cleveland, Ohio.

59. Rack Trucks
Information on rack trucks designed for batch-type baking operations. Wilder Mfg. Co., Inc., Dept. H, Mechanic St. & Erie RR., Port Jervis, N. Y.

60. Baking and Drying Ovens
Bulletin 157 describes line of batch and conveyor-type baking ovens for heating up to 1,000 deg. F. Young Brothers Co., 1830 Columbus Rd., Cleveland 13, Ohio.

61. Clear Semi-Gloss Lacquer
Information on Agateen No. 2B semi-gloss lacquer. Agate Lacquer Mfg. Co., Inc., 11-13 43rd Rd., Long Island City, New York.

62. Degreasing Solvent
Information on Blacosolv degreasing solvent. Dept. 104-1, G. S. Blakeslee & Co., 1844 S. Laramie Ave., Chicago 50, Illinois.

63. Tack Cloth
Literature on treated cloths that pick up dust and lint prior to paint finishing. Bond Chemical Products Co., 2639 N. Clybourn Ave., Chicago 14, Ill.

64. Rhodium Plating Instructions
Handy pocket-sized booklet gives complete instructions for rhodium plating, includes data on solution preparation, work preparation, temperatures and current densities, tanks, anodes, and so on. Sigmund Cohn Mfg. Co., Inc., 121 S. Columbus Ave., Mount Vernon, N. Y.

65. Aluminum Etchant
Technical data sheet on Cowles AK tells how this formulation works on all aluminum alloys, prevents build-up of scale by means of a special sequestering agent. Cowles Chemical Co., 7016 Euclid Ave., Cleveland 3, Ohio.

66. Water Wash Spray Booth Compound
Information on Diff. LX Klarifiant, a spray booth compound that is said to prevent clogged nozzles, booth rusting, foam, and curtain "build-up." DuBois Co., Inc., 1120 W. Front St., Cincinnati 3, Ohio.

67. Spray-Mask Painting Machine
Information on a spray-mask painting and mask-washing machine that requires no spray booth, is useful for painting small parts in as many as three colors. Dumatic Devices, Inc., 22833 Dequindre, Hazel Park, Mich.

68. Electropolishing Stainless Steel
Literature on baths for electropolishing stainless steel includes operating instructions for two of these baths. Electro-Glo Co., 621 S. Kolmar Ave., Chicago 24, Ill.

69. Roller Coating Equipment
Information on Gasway equipment for roller coat finishing. Gasway Corporation, 6463 N. Ravenswood Ave., Chicago 16, Illinois.

70. Bright Copper
Data sheet describes Cynorex high-speed copper cyanide plating process and Cuprex acid copper plating process, tells about advantages of each. Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.

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71. Plating Course
Information on a correspondence course in electroplating. Joseph B. Kushner Electroplating School, P. O. Box 2066, Station "D," Evansville 14, Indiana.

72. Baking and Drying Equipment
Catalog No. 560 describes and illustrates various types of baking and drying equipment. The Lanly Co., 2800 Euclid Ave., Cleveland 15, Ohio.

73. Tumbling and Burnishing Products
A 10-page booklet shows various types of burnishing barrels, tumbling barrels, burnishing materials, tumbling abrasives. Chas. F. L'Hommedieu & Sons Co., 4521 Ogden Ave., Chicago, Ill.

74. Drum-Handling Tools
Literature on a line of drum-handling tools and equipment: drum upenders, drum wrenches, carts and so on. Morse Mfg. Co., Inc., 762 W. Manlius St., E. Syracuse, N. Y.

75. Paint Test Panels
Form No. A7310 describes phosphatized test panels made under carefully controlled conditions to assure uniformity for use in testing paints. Parker Rust Proof Co., 2172 E. Milwaukee Ave., Detroit 11, Mich.

76. Plating Room Floor Coating
Bulletin CP-627 tells about Penntrowel, a surfacing material that protects floors against acids and corrosives. Pennsalt Chemicals Corporation, Dept. 680, Natrona, Pa.

77. Electrostatic Hand Gun
A 4-page folder tells how the new Ransburg hand-held electrostatic spray gun works, what it will do. Includes photos and diagrams of the new gun. Ransburg Electro-Coating Corp., P. O. Box 7822, Indianapolis 23, Indiana.

78. Temperature Control
Bulletin 1025-B describes temperature controllers that hold solutions at pre-set temperatures automatically. Sarco Co., Inc., 635 Madison Ave., New York 22, New York.

79. Bias Buffs
Information on the advantageous features of Schaffner bias buffs. Schaffner Manufacturing Co., Inc., Schaffner Center, Emsworth, Pittsburgh 2, Pa.

80. Precious Metal Plating Equipment, Supplies
Catalog No. CHP gives details on equipment, solutions and processes for depositing precious metals. Sel-Rex Corporation, Nutley 10, N. J.

81. Filter Pump Units
Bulletin 103 contains complete data on Sethco filter pumps for removing solids from acid and alkaline solutions. Sethco Mfg. Co., 2292 Babylon Turnpike, Merrick, L. I., N. Y.

82. Weather Testing Service
Data sheet describes company's scope and activities, facilities, special services. South Florida Test Service, 4301 N.W. Seventh St., Miami 44, Florida.

83. Spray Nozzle Catalog
Catalog No. 24 is a 48-page booklet containing complete data on various spray nozzles and accessories. Nozzles are listed in tabular form and complete information is given on pipe sizes, external dimensions, orifice diameters, capacities and spray angles. Spraying Systems Co., 3229 Randolph St., Bellwood, Ill.

84. Zinc Plating Additive
Data on Zinc Brite, a cleansing and purifying agent for cyanide zinc plating solutions. Sulphur Products Co., Inc., 621 W. Pittsburgh St., Greensburg, Pa.

85. Etch Primer
Data on Gripalloy, an etch primer available in black and colors. Used as primer or finish coat. Tenax, Newark 5, N. J.

86. Cob Grits for Blasting, Tumbling
Information on corn cob grits that are used as tumbling media and in blast cleaning. Ti-Co Industries, Inc., P. O. Box 185, Tipton, Indiana.

87. Brass Plating Solution
Technical bulletin on True Brite brass solution, which is available in a variety of colors. True Brite Chemical Products Co., Box 31, Oakville, Conn.

88. Copper Anodes
Information on "Phosphor-Brite" rolled copper anodes for acid copper plating baths. Univertical Foundry and Machine Co., 14841 Meyers Rd., Detroit 27, Mich.

89. Coated Abrasives
Information on the company's line of coated abrasive products: belts, rolls, sheets, discs, specialties. Abrasive Products, Inc., South Braintree 85, Mass.

90. Cold Stripper
Literature sheet describes Electro Cold Stripper, a solution that can be sprayed, used for dipping, or brushed on to remove organic coatings. Allied Finishing Specialties Co., 2641 W. Grand Ave., Chicago 12, Ill.

91. Tank Lining
Literature describes advantageous features of Amercoat PVC tank lining. Amercoat Corp., Dept. EB, 4809 Firestone Blvd., South Gate, Calif.

92. Cleaning Compound
Information on Apex 764, a moderately alkaline composition containing deflocculators and emulsifiers for removing insoluble soils from ferrous metals. Apex Alkali Products Co., Main & Rector Sts., Philadelphia 27, Pa.

93. Centrifugal Machinery
A 16-page brochure describes line of centrifugal machinery that includes oil extractors, dryers, washers, washer-dryers, galvanizers, enamelers, impregnators, other machinery. Includes performance and application data. Leon J. Barrett Co., 1449 Grafton Rd., Worcester 1, Massachusetts.

94. Selection of Offhand Belt Finishing Materials
Selection of offhand belt finishing materials is simplified by means of a wall chart that lists proper abrasives, grit size and type, belt speed, lubricant and contact wheel for 16 of the most popular metals and alloys. Behr-Manning Co., Dept. PF-2, Troy, N. Y.

95. Chromic Acid
Information on BFC chromic acid. Better Finishes & Coatings, Inc., 268 Doremus Ave., Newark 5, N. J.

96. Metal Cleaning Equipment
Bulletin 521 describes company's line of metal-cleaning equipment. Circo Equipment Co., 122 Central Ave., Clark (Rahway) N. J.

97. Filters for Electroplating
Bulletin GEO-508 is entitled "A New Concept of Electroplating Filtration." It explains how Fulflo filters with Honeycomb filter tubes provide tank turnover up to three times per hour. Includes description of new stainless steel filter. Commercial Filters Corp., 2 Main St., Dept. PF, Melrose 76, Mass.

98. Barrel Plating Equipment
A 12-page bulletin on the Udylite line of barrel plating equipment describes plastic cylinders, cluster barrels, multiple-barrel units, complete barrel plating systems, storage and transfer units, dryers, final rinse units, other related equipment. Udylite Corp., Detroit 11, Mich.

99. Spray Nozzles
Catalog No. 33-A is designed to help the user select the proper type of spray nozzle for a particular application. Complete data on each type of nozzle, including photo, construction details, capacity, recommended uses, spray characteristics, materials available. Delavan Mfg. Co., Grand Ave. and Fourth St., West Des Moines, Iowa.

100. Titanium Anodizing Cylinder
Data sheet describes and illustrates an all-titanium anodizing cylinder that is useful in bulk processing of bolts, rivets, screws. Requires no stripping, resists acids. Detroit Industrial Process Co., 9301 French Rd., Detroit 13, Mich.

101. Basic Principles of Spray Painting Equipment
Booklet entitled "The ABC's of Spray Equipment" answers common questions pertaining to spray guns, cups, tanks, air filters, air compressors, respirators, spray booths, other spray painting equipment. Includes suggestions for operation and maintenance. The DeVilbiss Co., Toledo 1, Ohio.

102. Methylene Chloride
Information on methylene chloride, for use in paint and varnish removers and for cold cleaning. Dow Chemical Co., Midland, Mich.

103. Solution-Level Control
Details on a device that will automatically control the level of solution in a tank. Elkhart Controls Co., Dept. T, Route No. 2, Elkhart, Indiana.

104. Black Finishes
Information on Ebonol products for blackening steel, copper, brass, zinc. Enthone, Inc., 442 Elm St., New Haven 11, Conn.

105. Cabinet Ovens
Bulletin 3-GH-456 lists features of Grieve-Hendry cabinet ovens, includes specifications for various sizes and types. Grieve-Hendry Co., Inc., 1414 W. Carroll Ave., Chicago 7, Ill.

106. Abrasive Belt Polishing Machines
Bulletin 337-T describes several models of abrasive belt grinders, buffers, polishers, tells what each machine will do, its advantages, general specifications. Hammond Machinery Builders, Inc., 1622 Douglas Ave., Kalamazoo, Mich.

107. Electroplating Processes
Bulletin EP-101 lists cadmium, copper, nickel, silver and zinc plating processes, includes specific data on each process—solution preparation, type of deposit produced, type of solution, operating conditions, equipment required, and applications. Hanson-Van Winkle-Munning Co., Matawan, N. J.

108. Abrasive Belt Polishing Machines
Information on Hill Acme abrasive belt polishing machines for polishing flat surfaces of ferrous and non-ferrous metals. The Hill Acme Co., 1207 W. 65th St., Cleveland 2, Ohio.

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109. Plating Waste Recovery
Literature describes systems for recovering valuable materials from plating wastes. These systems will return fresh plating solutions to the plating tanks and at the same time return pure water to rinse tanks. Industrial Filter & Pump Mfg. Co., 5904 Ogden Ave., Chicago 50, Illinois.

110. Conveyorized Finishing Systems
Information on finishing systems for painting articles that are turned out in large quantities. Industrial Ovens, Inc., 13811 Triskett Rd., Cleveland 11, Ohio.

111. Thickness Tester
Description of the Kocour Model 955 electronic plating thickness tester. Kocour Co., 4814 S. St. Louis Ave., Chicago 32, Illinois.

112. Tumbling Machines
Literature describes and illustrates various tumbling machines. H. W. Kramer Co., 120-30 Jamaica Ave., Richmond Hill 18, New York.

113. Stripping Additive
Special bulletin on Magnus Activall, an additive said to increase efficiency and effectiveness of caustic strippers. Magnus Chemical Co., Inc., 208 South Ave., Garwood, N. J.

114. Coated Abrasive Wheel
Information on grits and sizes of Grind-O-Flex flexible coated abrasive wheels. These wheels are made of hundreds of sheets of coated abrasive paper, produce uniform finish during entire wheel life. Merit Products, Inc., 3691 Lenawee Ave., Los Angeles 16, Calif.

115. Setting Up Polishing Wheels and Belts
Form 1340, a 45-page booklet on methods of setting up polishing wheels and belts for metal finishing operations, includes detailed instructions on abrasive grains, glue and its preparation, types of polishing wheels and their fields of use, correct drying of polishing wheels, handling and storage, other related subjects. Norton Co., Worcester 6, Mass.

116. Paint Stripper
Four-page folder describes Oakite Stripper S-A, a compound that is useful in removing epoxies, acrylics, vinyls, polyesters, other hard-to-remove finishes. Requires no heat, has built-in water seal. Oakite Products, Inc., 20 Rector St., New York 6, N. Y.

117. Silicon Rectifiers
Illustrated brochure tells about the advantages of silicon rectifiers. Syntron Co., 452 Lexington Ave., Homer City, Pa.

118. Black Oxide
Bulletin H-16 tells how to produce a rust-resistant black finish that is also an excellent base for topcoats of lacquer or enamel. Park Chemical Co., 8078 Military Ave., Detroit 4, Mich.

119. Industrial Gloves
Industrial glove catalog lists and describes many different types of gloves. Pioneer Rubber Co., 285 Tiffin Rd., Willard, Ohio.

120. Thermosetting Acrylic Enamel
Brochure contains information on Duracron thermosetting acrylic enamel, tells how this coating can reduce manufacturing costs. Pittsburgh Plate Glass Co., Industrial Finishes Div., 1 Gateway Center, Pittsburgh, Pa.

121. Paint Arrestors
Information on RP paint arrestors, dry-type filters for removing paint solids from spray booth exhaust air. Research Products Corp., Dept. 38, Madison, Wis.

122. Oven Guide
Catalog No. 122 serves as a guide for selecting the right oven to bake, dry, cure, paint, varnish, lacquer and enamel parts and assemblies. W. S. Rockwell Co., 2028 Eliot St., Fairfield, Conn.

123. Spraying Wash Primer
Information on Stantite Spraying Wash Primer, a two-package rust-inhibiting primer that is said to improve the quality of any topcoat, air-dry or bake. Stanley Chemical Co., Dept. PF, 1338 Berlin St., East Berlin, Conn.

124. Pump for Corrosives
Eight-page catalog describes company's line of pumps, which are designed to handle corrosive solutions with trouble-free service. Available with various body and liner materials, designed so as to eliminate stuffing boxes and shaft seals. Vanton Pump and Equipment Corp., Hillside, N. J.

125. Acid-Resistant Clothing
Detailed data on a complete line of acid and chemical resistant industrial apparel is contained in the 1958 Worklon Catalog. Worklon, Inc., 253 W. 28th St., New York 1, N. Y.

126. Cleaning and Finishing Products for Aircraft Industry
Booklet F2178 describes complete line of products for aircraft cleaning and maintenance: products for aluminum, magnesium and steel cleaning; spray booth maintenance; aluminum brightening; removing carbon; removing paint; and others. J. B. Ford Div., Wyandotte Chemicals Corp., Wyandotte, Mich.

127. Non-Destructive Coating Thickness Tester
Dermitron Bulletin DF tells about what the Dermitron is (an instrument for non-destructive coating thickness determination of metals on metals, metals on non-conductors, non conductors on metals), desirable features of the instrument, specifications, accessories. Unit Process Assemblies, Inc., 61 E. Fourth St., New York 3, N. Y.

128. Rectifier-Replacement Assembly
Information on the Tri-Amp high-current-density rectifier replacement assembly, used in modernizing old selenium rectifiers with units said to be more efficient, with longer life, supplying more current per cell. Radio Receptor Co., Inc., 240 Wythe Ave., Brooklyn 11, N. Y.

129. Clear Protective Coating
Data sheet on Irilac No. 1000, a clear, water-soluble protective coating that provides corrosion resistance and resistance to fingerprinting and abrasion without changing the appearance of the metal. For use on bare metal, conversion coated surfaces, electroplated finishes. Allied Research Products, Inc., 4004-06 E. Monument St., Baltimore 5, Maryland.

130. Barrel Finishing Materials
Price list (Form A-23-PL) includes specifications for compounds (descaling, burnishing, grinding, rust-inhibiting types) and media (bonded, oxide, regular, limestone, granite and ceramic chips; steel burnishing balls, diagonals, pins, cones, tacks, ovalballs; wood balls, walnut shells, dry maize, other media). Almco, Queen Products Div., King Seeley Corp., 812 Main St., Albert Lea, Minn.

131. Conversion Coating for Aluminum
Bulletin 1424-A describes complete line of protective and prepaint treatments for aluminum. Discusses advantages, applications, equipment needed. Lists types of products treated and includes convenient selection chart. Amchem Products, Inc., Ambler 14, Pa.

132. Polishing Machine
A four-page folder describes and illustrates the Bader Spacer Saver, shows how this machine can be used with various types of abrasive belts and contact wheels. Can be used as swing frame or floor mounted. Stephen Bader & Co., Valley Falls, N. Y.

133. Pressure-Sensitive Tape Dispenser
Bulletin No. 525 tells about the Brady Tapematic, an electrically operated machine that will dispense masking tape, labels, pre-cut masks automatically. W. H. Brady Co., 727 W. Glendale Ave., Milwaukee 9, Wisconsin.

134. Complete Finishing Systems
Catalog No. 200 describes company's design, fabrication and installation services for complete finishing systems. Includes information on equipment for pre-paint treatment, paint application, paint drying and baking, make-up air and exhaust systems. Contains descriptions of typical installations and detailed information on individual components. Cincinnati Cleaning & Finishing Machinery Co., 2008 Hageman St., Cincinnati 41, Ohio.

135. Advantages of Fused Quartz Ovens
The case for fused quartz ovens is stated in a recent "Clepco News Bulletin" prepared by Cleveland Process Corp. Both theoretical and practical considerations are covered, and absorption curves and charts are included to illustrate the points made. The bulletin discusses reasons for the high efficiencies obtained in the fused quartz ovens manufactured by the company. Cleveland Process Corp., 1965 E. 57th St., Cleveland 3, Ohio.

136. Spray Decorating Equipment
A data file of spray decorating equipment includes information on electroformed masks, clamps and pressure fixtures, automatic mask washers, automatic spray decorating machines. Conforming Matrix Corporation, 356 Toledo Factories Bldg., Toledo 2, Ohio.

137. Cadmium Brightener and Bright Dip
Information on a compatible brightener and bright dip to be used on cadmium plate. In liquid form, Kenvert No. 25-LM, the brightener, is said to produce uniform, reproducible results with any Kenvert chromating treatment—clear bright, iridescent, olive drab. Conversion Chemical Corporation, 99 E. Main St., Rockville, Conn.

138. Respirator
Information on the Dupor No. 4 Respirator, for filtering out overspray, protecting lungs from paint, fumes, dust. H. S. Cover, Dept. PF, South Bend 14, Indiana.

139. Cleaner-Phosphatizer
A four-page folder on Divobond, a material that cleans and phosphatizes in one operation, produces no scale. Diversey Corporation, 1820 Roscoe St., Chicago 13, Illinois.

140. Silicone-Based Paints
Protective coatings formulated with Dow Corning silicone resins are said to bridge the gap between paints and porcelain in resistance to heat, weathering and corrosive atmospheres. Folder No. 7-903 describes the properties of modified silicone paints, straight silicone paints and siliconized paints, tells where each should be used. Dow Corning Corporation, Midland, Mich.

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141. Laboratory Equipment Catalog
Catalog lists laboratory instruments, tells what each will do. Includes instruments for measuring color, reflectance, gloss, haze; viscosity, consistency, oil-testing; heating and cooling baths; humidity and salt spray cabinets; film applicators; film-thickness gages; tensile-strength gages; instruments for measuring drying time, hardness, flexibility, adhesion, washability; mills, mixers, stirrers; centrifuges; lab ovens; thermometers, hygrometers; drum tools, drum warmers, many others. Gardner Laboratory, Inc., Bethesda 14, Md.

142. Buffs
Folder describes company's line of buffs: bias-type cloth, sisal, cloth uniflex, others. Garfield Buff Co., 6 Clinton Rd., Caldwell, N. J.

143. Chemical-Resistant, Flexible Paint
Paint based on Hypalon (chlorosulfonated polyethylene) is said to have excellent resistance to chemicals, good flexibility. Can be applied by conventional methods. Detailed data available. Grand Rapids Varnish Corporation, 1350 Steele Ave., S.W., Grand Rapids 2, Mich.

144. Instruments for Measuring Hiding Power and Thickness
Descriptive folder on the Pfund Cryptometer and the Pfund Paint Film Gage. Koehler Instrument Co., Inc., 168-56 Douglas Ave., Jamaica 33, N. Y.

145. Crack-Free Chromium
Bulletin CFC-2 describes the Unichrome Crack-Free chromium plating process, includes photomicrographs to show structure of the deposits. These deposits are said to improve corrosion resistance, have other advantages. Metal & Thermit Corporation, Rahway, N. J.

146. Polishing-Grinding Wheels
Illustrated booklet describes "PG" (polishing and grinding) wheels. Called Modern Metal Finishing with 3M PG Wheels," this booklet covers applications of these wheels in finishing appliances, furniture, dairy equipment, machinery and other metal products. These wheels are formed from hundreds of die-cut, cloth-backed coated abrasive leaves locked in a hub. They are said to have excellent conformability. Minnesota Mining and Manufacturing Co., Dept. FI-29, 900 Bush Ave., St. Paul 6, Minn.

147. Vacuum Coaters
An eight-page catalog includes sections on principles of the vacuum coating process; production steps; applications; economics; and equipment. NRC Equipment Corporation, a Subsidiary of National Research Corporation, 160 Charlemont St., Newton Highlands 61, Mass.

148. Orbital Sander
Catalog describes and illustrates the Mity-Midget, an orbital sander that weighs only four pounds, yet cannot be stalled even by standing on it. National-Detroit, Inc., Rockford, Ill.

149. Airless Spray Equipment
Four-page catalog tells how airless spray painting process works, describes advantages, equipment required and accessories available. Nordson Corporation, Jackson St., Amherst, Ohio.

150. Copper and Nickel Sulfate
Information on Triangle Brand copper and nickel sulfates, for use as sources of copper and nickel in plating. Phelps Dodge Refining Corp., 300 Park Ave., New York 22, N. Y.

151. Dry Acid
Fluromine is a dry powdered, fluoride-containing compound used in acid treatment of metals. It is said to be less hazardous than liquid hydrofluoric acid. Can be used in acid pickling of colloidal silicate films, for pickling sand castings, for smut removal, activating and bright etching of aluminum and magnesium alloys, pickling of stainless steels and titanium. Complete details in Data Sheet No. 110, Platers Research Corp., 59 E. 4th St., New York 3, N. Y.

152. Thinners
Folder describes Kleensolv, a thinner used for cleaning equipment, hands, etc.; Synthesolv Reducer, for reducing synthetic enamels to spraying consistency; Mistkote Spraying Thinner, a lacquer thinner with a retarder that is said to aid in producing better flow, gloss and blush resistance; and other thinners. Potter Paint Co., Inc., 22 Crawford St., Cortland, N. Y.

153. Finishing Equipment
Bulletin 600 describes the complete line of Schmieg finishing equipment. Complete systems and individual components are shown. Schmieg Industries, Inc., P. O. Box 4701, Detroit, Mich.

154. Complete Finishing Systems
Literature on Spra-Con complete finishing systems for applying organic coatings. Data on components such as washers, ovens, flow-coat machines, conveyors, air make-up systems. The Spra-Con Co., 3600 Elston Ave., Chicago 18, Ill.

155. Buffing Compositions
A 16-page booklet on polishing and buffing compounds contains useful data on how to test compositions in the plant; tables that give recommended compositions for use on plated or unplated surfaces; a peripheral speed chart; details on specific compositions. Frederic B. Stevens, Inc., Detroit 16, Mich.

156. Phosphate Coating

Bulletin No. 108-19 describes Turcoat 4333, a liquid material used for phosphatizing iron, steel and zinc, where a smooth, tight, crystalline coating is required. Can be used as a paint base and as a base for supplementary oil finishes. Turco Products, Inc., 6135 S. Central Ave., Los Angeles 1, Calif.

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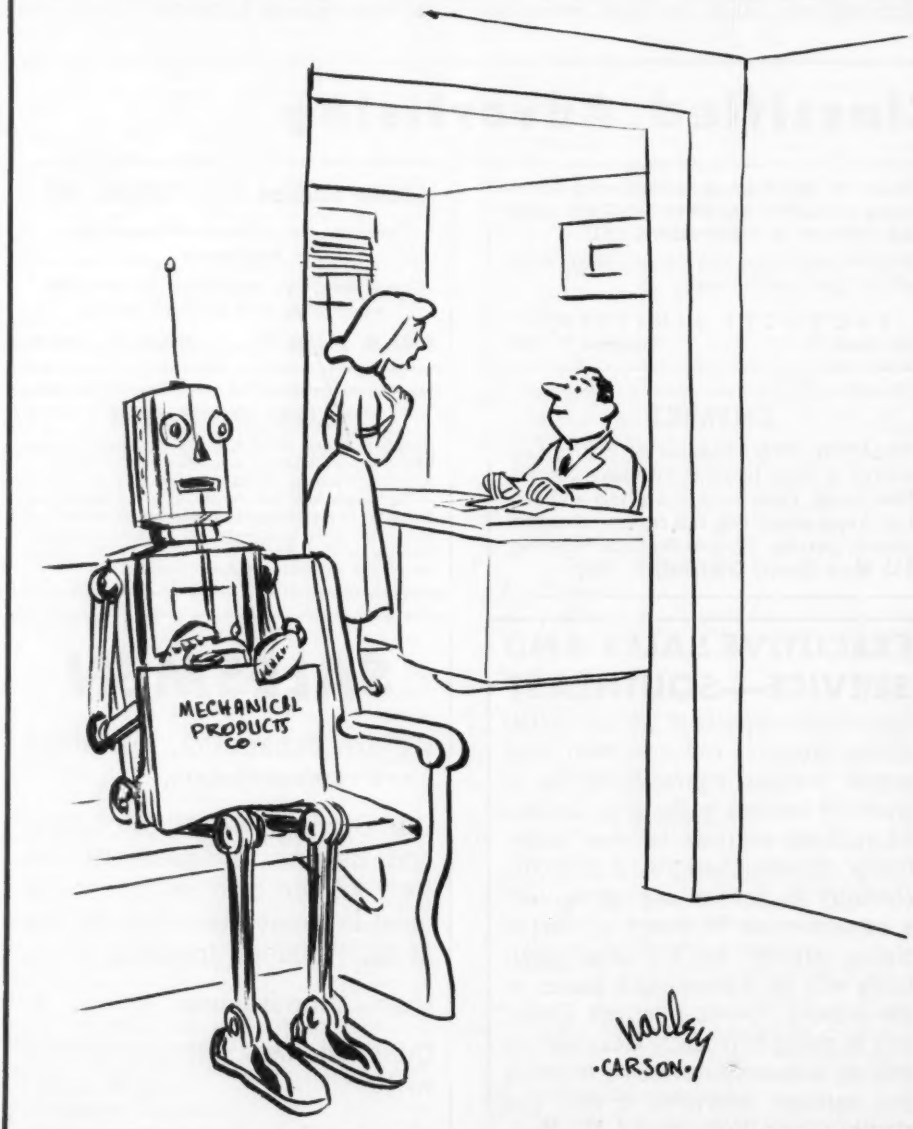

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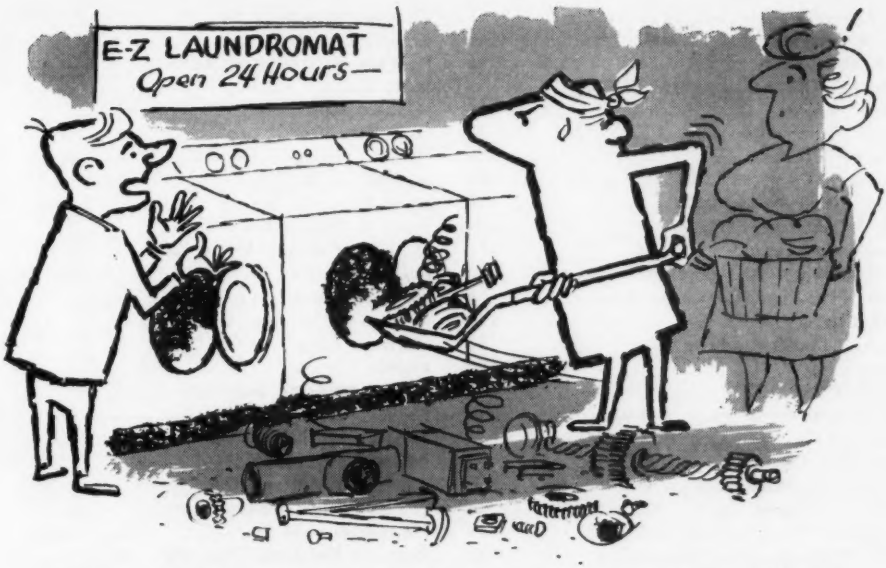

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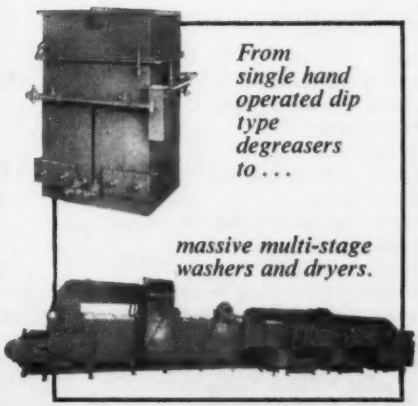
Blakeslee Niagara Metal Parts Washers thoroughly spray surfaces, crevices and blind holes 100% grease-free to reduce rejects—speed up production. Blakeslee Solvent Vapor Degreasers use less solvent to clean parts of any size or shape while doing a faster, more thorough job. Most Blakeslee Machines are available with Branson "Sonogen" Ultrasonic equipment. And for additional savings specify BLACOSOLV—the fast-acting degreasing solvent with the original neutral stabilizers that prevent solvent breakdown and are carried over in the distillation process. Have your Blakeslee man make a free cost analysis of your cleaning operation—write today!



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New York • Los Angeles • Toronto

Department 104-I
1844 So. Laramie Ave.
Chicago 50, Illinois

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16	32	48	64	80	96	112	128	144	160	316	329	345	361	377	393	409	425	441	457

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CITY _____ ZONE _____ STATE _____

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*** MODEL M-50 IONIC CENTRIFUGAL ATOMIZERS**

* PATENTS APPLIED FOR

Due to extensive research and development, Ionic Electrostatic Corporation was granted numerous patents on electrostatic spray systems. Many other patents are pending on airless centrifugal type electrostatic coating processes and apparatus.

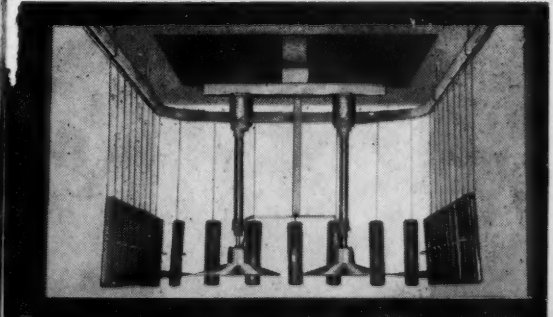
Since it is the policy of Ionic to sell all systems outright without further remuneration or royalty payments, Ionic has obtained a **Million Dollar Patent Infringement Policy** for protection of their customers or users of their new processes. A certificate of insurance is issued directly from the insurance company to each customer for a total of One Million Dollars.

This type of protection was obtained to nullify misleading statements concerning patents. Ionic will now replace other existing equipment with Royalty-Free insured systems far superior in performance to any apparatus in operation today.

This new approach to sales was enthusiastically received at the recent National Metal Exposition in Cleveland, Ohio. Tremendous interest arose particularly in the new Model M-50 Ionic Electrostatic Spray Systems which incorporate airless centrifugal atomizers capable of producing single solid color or multi-color finishes without special coating materials.

With the emphasis that is placed on color in today's consumer market, interest from manufacturers and the finishing industry indicates this development to be one of the most important of recent years for applying unique durable finishes under economical mass production methods.

Further information and literature is available upon request.



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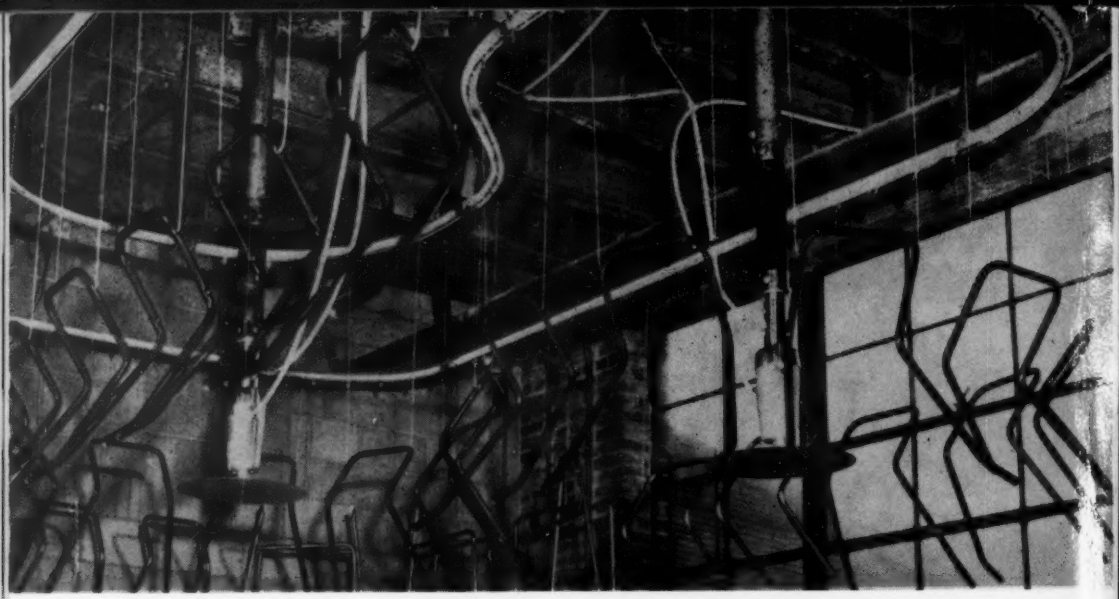


GREATER FLEXIBILITY...

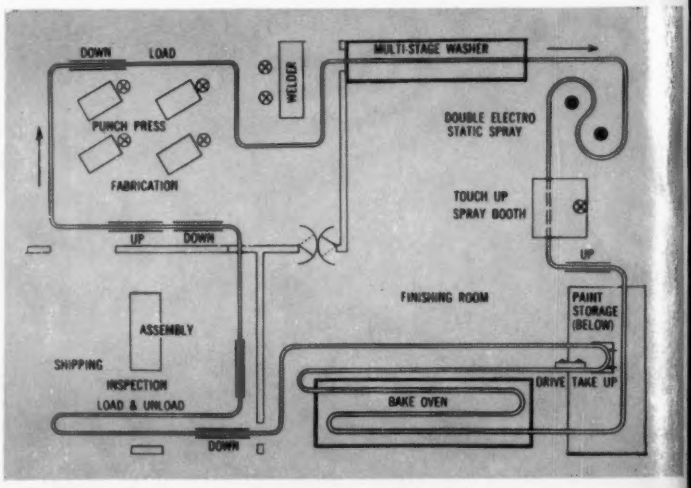
fewer rejects

through integrated processing!

The Chainveyor overhead conveyor system used in this complete finishing process for metal furniture eliminates in-process handling and utilizes the full potential of integrated processing.

A continuous flow of unfinished parts through pre-paint cycles and bake oven, is accomplished without costly intermediate manual transfer. The versatility and adaptability of the Chainveyor system for close tolerances and critical distances between conveyor curves and spinning paint discs, are credited with superior quality finishing and a substantial reduction in rejects.

Added flexibility is gained through the use of 6-inch load spacing and a variable speed drive. Job Shop operations assume the characteristics of continuous high production runs. Increased floor space results from the placement of the bake oven and cooling loop near the ceiling.



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- Sheets for preliminary layouts.

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